
# 2012 Annual Inspection and Maintenance Report for North Maybe Mine - East Mill Creek Restored Sediment Control Structure

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## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AOC/CO | Administrative Order on Consent/Consent Order |
| BMP | Best Management Practice |
| EPA | Environmental Protection Agency |
| GPM | Gallons Per Minute |
| IDEQ | Idaho Department of Environmental Quality |
| TCRA | Time Critical Removal Action |
| USFS | United States Department of Agriculture, Forest Service |

## 1.0 INTRODUCTION

The restoration of the Sediment Control Structure located at the toe of the East Mill Dump at the North Maybe Mine (the Site) was completed in the fall of 2008 as a Time Critical Removal Action (TCRA), in accordance with the 2004 Administrative Order on Consent/Consent Order (AOC/CO) entered into by Nu-West Industries, Inc. and Nu-West Mining, Inc. (collectively Nu-West), the United States Department of Agriculture Forest Service (USFS), the United States Environmental Protection Agency (EPA), and the Idaho Department of Environmental Quality (IDEQ). The purpose of the restoration project was to contain, consolidate, and isolate sediments which contain elevated concentrations of selenium, to restore sediment retention ponds, and to implement erosion control measures on the face of East Mill Dump. The Site activities were completed according to the "Work Plan for a Time Critical Removal Action, North Maybe Mine East Mill Creek Sediment Control Structure Restoration" dated August 13, 2008. The USFS issued the "Time Critical Removal Action Memorandum", approving the proposed work plan, on August 18, 2008.

At the completion of the restoration project, Nu-West issued the "Report of As-Built Construction Activities for the Time Critical Removal Action, North Maybe Mine East Mill Creek Sediment Control Structure Restoration" (May 2009). Additionally, Nu-West issued the "Inspection and Maintenance Plan for the North Maybe Mine East Mill Creek Restored Sediment Control Structure" in May 2009 which indicated that inspection and maintenance for the sediment control structure should be completed and documented in an annual report.

### 1.1 PURPOSE

The purpose of this report is to document the inspection and maintenance activities that took place during the 2012 field season.

### 1.2 PROJECT LOCATION

The Site is located on the east side of Dry Ridge within the northern perimeter of the North Maybe Mine site, which is approximately 18 air miles northeast of Soda Springs, Idaho (Figure 1-1) and involves Federal Phosphate Leases I-04 and I-8289, as well as portions of USFS Special Use Permits SSC21 and SSC23.

## 2.0 SUMMARY OF SITE INSPECTION RESULTS AND MAINTENANCE ACTIVITIES

In accordance with the Inspection and Maintenance Plan, site inspections were completed on a monthly basis from May through October. Site inspections were completed on the following dates: May 2, June 5, July 5, August 6, September 4, and October 1. As the result of a localized heavy rain event that occurred in July, some maintenance to the access road ditches and sediment control structure was necessary. This maintenance was implemented October 22 through November 2. The following features at the site were inspected during each site inspection:

- Rills on the East Mill Dump,
- Riprap Energy Dissipater,
- Riprap Toe Berm,
- Sediment Control Structure,
- Riprap below culvert outfalls,
- Graded area at the Sediment Control Structure,
- West Mill Dump Sediment Soil Consolidation Area, and
- Growth media borrow area.

Each of these site features are identified on either Figure 2-1 or 2-2. Features that immediately surround the sediment control structure are presented on Figure 2-2 while features that are further away (e.g., soil consolidation area, growth media borrow area) are shown in Figure 2-1.

During each inspection, a site inspection form was completed and photos were taken documenting the results of the inspection. The site inspection forms and photos for each inspection are included in Appendix A. All maintenance items are documented on the corrective action log, including the deficiency, the corrective action needed, and the date(s) action was taken. Additionally, pre and post-maintenance photos are included after the corrective action log. The corrective action log and photos are included in Appendix B.

Surface water samples were collected at IA1-55 (toe of East Mill Dump), IA1-28A (sediment pond), and IA1-30A (East Mill Creek below the sediment control structure) on a monthly basis from May through October. The sampling locations are shown on Figure 2-3. The results for total and dissolved metals are presented in Table 2-1. The results for inorganic parameters are presented in Table 2-2. The field parameters and flow measurements are presented in Table 2-3. A summary of each site inspection and a description of maintenance activities are provided below.

## 2.1 MAY 2 SITE INSPECTION

The first site inspection was completed on May 2, 2012. Snowpack left early this year and access to the site was relatively easy in early May. Flows at IA1-55 and IA1-30A were estimated to be 134 and 95 gallons per minute (gpm), respectively. The sediment pond contained water at a depth of 9.17 feet and was flowing through the coarse riprap covering the spillway of the sediment control structure. The water in the sediment pond was clear and the bottom of the pond was visible. No sediment accumulation was observed.

Surface water samples were collected at sample sites IA1-55, IA1-28A, IA1-30A during this site inspection and serve as the monthly sampling event for May. The metals results are provided in Table 2-1. Figure 2-4 presents time series plots for each of the three samples. As can be seen in these time series plots, the concentration of selenium observed in May 2012 is slightly lower than concentrations of selenium observed in May 2011. Figure 2-5 presents time series flow plots for sample sites IA1-55 and IA1-30A. As can be seen in these flow plots, flows during the May 2012 sampling event, measured at 134 gpm, were considerably lower than those measured during the May 2011 sampling event of 673 gpm.

Some of the site features were partially covered in snow but generally appeared to be stable and functioning properly. The runoff volumes appeared to be quite low this spring. The inspection forms and photos are presented in Appendix A.

## 2.2 JUNE 5 SITE INSPECTION AND MAINTENANCE ACTIVITIES

The second site inspection was completed on June 5, 2012. Eight storm events, producing greater than 0.1 inches of precipitation, occurred since the previous inspection on May 2. These storms resulted in precipitation amounts ranging from 0.11 inches to 0.50 inches. These storms did not meet the 100-year, 24-hour storm or 25-year, 1-hour storm criteria which would require an additional inspection. Therefore, this inspection served as the regular monthly inspection.

Flow at IA1-55 was approximately 32 gpm and flow IA1-30A was approximately 17 gpm. The sediment pond contained water at a depth of 8.95 feet and water was flowing through the coarse riprap covering the spillway of the sediment control structure. The water in the sediment pond was green and the bottom of the pond was not visible. No sediment accumulation was observed.

Surface water samples were collected at sample sites IA1-55, IA1-28A, IA1-30A during this site inspection and serve as the monthly sampling event for June. The metals results are provided in Table 2-1. Figure 2-4 presents time series plots for each of the three samples. As can be seen in these time series plots, the concentration of selenium observed in June 2012 is higher than concentrations of

selenium observed in June 2011. Figure 2-5 presents time series flow plots for sample sites IA1-55 and IA1-30A. As can be seen in these flow plots, Flows during the June 2012 sampling event, measured at 32 gpm, were considerably lower than those measured during the June 2011 sampling event of 233 gpm.

All of the BMPs were in good condition during the inspection. The site was stable and had handled the spring runoff with no issues. Vegetation had begun to grow and the site flows had subsided considerably since the previous inspection. The inspection forms and photos are presented in Appendix A.

## 2.3 JULY 5 SITE INSPECTION

The third site inspection was completed on July 5, 2012. One storm event of 0.07 inches occurred since the previous inspection on June 5. This storm did not meet the 100-year, 24-hour storm or 25-year, 1-hour storm criteria which would require an additional inspection. Therefore, this inspection served as the regular monthly inspection.

Flow at IA1-55 was approximately 19 gpm and flow IA1-30A was approximately 5.7 gpm. The sediment pond contained water at a depth of 8.9 feet and water was flowing through the coarse riprap covering the spillway of the of the sediment control structure. The water in the sediment pond was dark green. The bottom of the sediment pond was not visible. No apparent sediment accumulation was observed.

Surface water samples were collected at sample sites IA1-55, IA1-28A, IA1-30A during this site inspection and serve as the monthly sampling event for July. The metals results are provided in Table 2-1. Figure 2-4 presents time series plots for each of the three samples. As can be seen in these time series plots, the samples collected in July 2012 have slightly higher concentrations than those observed during the July 2011 sampling event.

All of the BMPs were in good condition during the inspection. The site was stable and functioning as designed. The inspection forms and photos are presented in Appendix A.

## 2.4 AUGUST 6 SITE INSPECTION

The fourth site inspection was completed on August 6, 2012. Three storm events greater than 0.10 inches occurred since the previous inspection on July 5. These storms resulted in precipitation amounts ranging from 0.11 inches to 0.68 inches. These storms did not meet the 100-year, 24-hour storm or 25-year, 1-hour storm criteria which would require an additional inspection. Therefore, this inspection served as the regular monthly inspection.

Flow at IA1-55 was approximately 16 gpm and flow IA1-30A was approximately 3.6 gpm. The sediment pond contained water at a depth of 8.9 feet. Water could be heard flowing though the coarse riprap located on the spillway of the sediment control structure but could not be seen. The water in the sediment pond was clear to a depth of approximately 2 feet. The bottom of the sediment pond was not visible due to algae in the pond.

Surface water samples were collected at sample sites IA1-55, IA1-28A, IA1-30A during this site inspection and serve as the monthly sampling event for August. The metals results are provided in Table 2-1. Figure 2-4 presents time series plots for each of the three samples. As can be seen in these time series plots, the samples collected in August 2012 have similar concentrations to those observed during the August 2011 sampling event.

Storm water runoff from a recent storm event (likely the July 7 event) concentrated in the area immediately below the soil consolidation area on West Mill Dump and formed a rill at the point where it flows down into the access road ditch. Additionally, the storm water scoured the access roadside ditch causing many of the sediment traps to fill, or partially fill, with sediment. The immediate TCRA area (toe berm, sediment pond, etc.) were not adversely affected by the storm. The rill was repaired and armored, maintenance was performed to the roadside ditch and the roadside sediment traps were cleaned out in October. A corrective action log and photos of the maintenance are presented in Appendix B. The inspection forms and photos are presented in Appendix A.

## 2.5 SEPTEMBER 4 SITE INSPECTION

The fifth site inspection was completed on September 4, 2012. One storm event occurred since the previous inspection on August 6. This storm resulted in a precipitation amount of 0.17 inches. This storm did not meet the 100-year, 24-hour storm or 25-year, 1-hour storm criteria which would require an additional inspection. Therefore, this inspection served as the regular monthly inspection.

Flow at IA1-55 was approximately 14 gpm and flow IA1-30A was approximately 2.1 gpm. The sediment pond contained water at a depth of approximately 8.75 feet. Water was not observed flowing though the coarse riprap located on the spillway of the sediment control structure. The water in the sediment pond was clear to a depth of approximately 2 feet. The bottom of the sediment pond was not visible.

Surface water samples were collected at sample sites IA1-55, IA1-28A, IA1-30A during this site inspection and serve as the monthly sampling event for September. The metals results are provided in Table 2-1. Figure 2-4 presents time series plots for each of the three samples. As can be seen in these time series plots, the samples collected during the same period in the previous year appear to have similar concentrations to those observed during the September 2012 sampling event.

The deficiencies noted in the August inspection regarding the rill and roadside ditch remain. All of the other BMPs were in good condition. Also noted was the North Dry Ridge mine permitting drilling crews had established an equipment and water storage area on the flat spot at the toe of the West Mill Dump waste consolidation area. The inspection forms and photos are presented in Appendix A.

## 2.6 OCTOBER 1 SITE INSPECTION

The sixth site inspection was completed on October 1, 2012. One storm event occurred since the previous inspection on September 4. This storm resulted in a precipitation amount of 0.10 inches. This storm did not meet the 100-year, 24-hour storm or 25-year, 1-hour storm criteria which would require an additional inspection. Therefore, this inspection served as the regular monthly inspection.

Flow at IA1-55 was approximately 15 gpm and flow IA1-30A was approximately 1.8 gpm. The sediment pond contained water at a depth of approximately 8.7 feet. Water was not observed flowing though the coarse riprap located on the spillway of the sediment control structure. The water in the sediment pond was clear to a depth of approximately 1.5 feet and the bottom of the sediment pond was not visible.

Surface water samples were collected at sample sites IA1-55, IA1-28A, IA1-30A during this site inspection and serve as the monthly sampling event for October. The metals results are provided in Table 2-1. Figure 2-4 presents time series plots for each of the three samples. As can be seen in these time series plots, the samples collected during the same period in the previous year appear to have similar concentrations to those observed during the October 2012 sampling event.

The deficiencies noted in the August inspection regarding the rill and roadside ditch remain. All of the other BMPs were in good condition. Also noted was the North Dry Ridge mine permitting drilling crews continued to utilize an equipment and water storage area on the flat spot at the toe of the West Mill Dump soil consolidation area. A small woody plant growing up through the riprap of the sediment control structure was pulled by its roots. The inspection forms and photos are presented in Appendix A.

## 2.7 OCTOBER 22 THROUGH NOVEMBER 2 MAINTENANCE ACTIVITIES

A site walk was conducted with Vaughn Smith Construction (VSC) on August 10 to evaluate the cost of maintenance and the timeframe for implementation. Between October 22 and October 29 the following maintenance items were completed by VSC:

- Sediment was removed from the sediment traps located in the access road ditches to restore the capacity of the sediment traps;
- Additional rip rap was placed in the bottom of the access road ditch to prevent erosion;

- The rill located along the ditch access road was lined with rip rap to allow water to flow freely into the ditch;
- Sediment was removed from the outlet of the culvert extending beneath the haul road located at the north end of the pit to maximize the flow capacity of the culvert;
- The drainage channel located along the north side of the haul road located at the north end of the pit was cleared of rock to re-establish the surface water flow line; and
- The interceptor trench located on the north face of East Mill Dump was cleaned out and regarded to re-establish surface water flow into the pit.

Additionally, on November 2 James Williams hand seeded and fertilized all areas that were disturbed during the October maintenance activities. The corrective action log and photos documenting repairs are presented in Appendix B.

## 3.0 FLOW MEASUREMENT SUMMARY

Two weirs were installed near the sediment control structure between October 12 and October 20, 2009. The weirs are holding up well. For completeness, discharge rate tables are included in this report for both the upper weir (Table 3-1) and the lower weir (Table 3-2). Figure 2-5 presents time series flow plots for sample sites IA1-55 and IA1-30A.

## 4.0 REFERENCES

AECOM. Inspection and Maintenance Plan for the North Maybe Mine East Mill Creek Restored Sediment Control Structure. May 2009.

AECOM. Technical Memorandum for the Proposed Weir Installation at the North Maybe Mine - East Mill Creek Restored Sediment Control Structure. October 2009.

HWS. Work Plan for a Time Critical Removal Action, North Maybe Mine East Mill Creek Sediment Control Structure Restoration. August 13, 2008.

HWS. Report of As-Built Construction Activities for the Time Critical Removal Action, North Maybe Mine East Mill Creek Sediment Control Structure Restoration. May 2009.

United States Forest Services (USFS). *Time Critical Removal Action Memorandum*. August 18, 2008.

# TABLES

**Table 2-1 Metals Results for Surface Water Samples by Date - 2012**

| Headwaters of East Mill Creek (All Results in mg/l) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contaminant of Concern | | Cd | L[1] | V[2] | Cr | L[1] | V[2] | Ni | L[1] | V[2] | Se | L[1] | V[2] | V | L[1] | V[2] | Zn | L[1] | V[2] | Hardness as CaCO3 |
| Location and Date | Site Description | Total | | | | | | | | | | | | | | | | | | |
| | | Dissolved | | | | | | | | | | | | | | | | | | |
| **May 2, 2012** | | Cd | L[1] | V[2] | Cr | L[1] | V[2] | Ni | L[1] | V[2] | Se | L[1] | V[2] | V | L[1] | V[2] | Zn | L[1] | V[2] | Hardness |
| IA1-55 | Toe of East Mill Dump | 0.0016 | | | 0.0180 | | | 0.0150 | | | 2.4 | | | 0.050 | | | 0.067 | | | 288 |
| | | 0.0016 | | | 0.0180 | | | 0.0150 | | | 2.3 | | | 0.051 | | | 0.066 | | | |
| IA1-28A | Sediment Ponds | 0.0016 | | | 0.0160 | | | 0.0140 | | | 2.2 | | | 0.048 | | | 0.059 | | | 283 |
| | | 0.0015 | | | 0.0170 | | | 0.0140 | | | 2.2 | | | 0.051 | | | 0.062 | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 0.0015 | | | 0.0170 | | | 0.0140 | | | 2.3 | | | 0.049 | | | 0.058 | | | 288 |
| | | 0.0014 | | | 0.0170 | | | 0.0130 | | | 2.2 | | | 0.049 | | | 0.057 | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure (Duplicate) | 0.0014 | | | 0.0160 | | | 0.0130 | | | 2.2 | | | 0.047 | | | 0.056 | | | 289 |
| | | 0.0014 | | | 0.0170 | | | 0.0130 | | | 2.2 | | | 0.048 | | | 0.056 | | | |
| **June 5, 2012** | | Cd | L[1] | V[2] | Cr | L[1] | V[2] | Ni | L[1] | V[2] | Se | L[1] | V[2] | V | L[1] | V[2] | Zn | L[1] | V[2] | Hardness |
| IA1-55 | Toe of East Mill Dump | 0.0019 | | | 0.0072 | | | 0.0170 | | | 2.0 | | | 0.041 | | | 0.080 | | | 341 |
| | | 0.0021 | | | 0.0072 | | | 0.0170 | | | 1.9 | | | 0.042 | | | 0.082 | | | |
| IA1-28A | Sediment Ponds | 0.0019 | | | 0.0076 | | | 0.0150 | | | 1.7 | | | 0.044 | | | 0.064 | | | 327 |
| | | 0.0017 | | | 0.0074 | | | 0.0150 | | | 1.9 | | | 0.044 | | | 0.065 | | | |
| IA1-28A | Sediment Ponds (Duplicate) | 0.0018 | | | 0.0076 | | | 0.0150 | | | 1.8 | | | 0.042 | | | 0.064 | | | 336 |
| | | 0.0018 | | | 0.0079 | | | 0.0150 | | | 1.9 | | | 0.045 | | | 0.067 | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 0.0013 | | | 0.0071 | | | 0.0120 | | | 1.8 | | | 0.036 | | | 0.045 | | | 337 |
| | | 0.0013 | | | 0.0073 | | | 0.0120 | | | 1.9 | | | 0.039 | | | 0.048 | | | |
| **July 5, 2012** | | Cd | L[1] | V[2] | Cr | L[1] | V[2] | Ni | L[1] | V[2] | Se | L[1] | V[2] | V | L[1] | V[2] | Zn | L[1] | V[2] | Hardness |
| IA1-55 | Toe of East Mill Dump | 0.0021 | | | 0.0058 | | | 0.0190 | | | 1.8 | | | 0.037 | | | 0.083 | | | 388 |
| | | 0.0021 | | | 0.0057 | | | 0.0180 | | | 2.1 | | | 0.039 | | | 0.083 | | | |
| IA1-55 | Toe of East Mill Dump (Duplicate) | 0.0021 | | | 0.0058 | | | 0.0190 | | | 1.8 | | | 0.037 | | | 0.082 | | | 374 |
| | | 0.0020 | | | 0.0055 | | | 0.0170 | | | 2.0 | | | 0.037 | | | 0.079 | | | |
| IA1-28A | Sediment Ponds | 0.0016 | | | 0.0057 | | | 0.0160 | | | 1.8 | | | 0.039 | | | 0.059 | | | 359 |
| | | 0.0011 | | | 0.0053 | | | 0.0140 | | | 2.0 | | | 0.039 | | | 0.043 | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 0.00081 | | | 0.0056 | | | 0.0090 | | | 1.8 | | | 0.028 | | | 0.024 | | | 374 |
| | | 0.00068 | | | 0.0055 | | | 0.0090 | | | 2.0 | | | 0.029 | | | 0.023 | | | |
| **August 6, 2012** | | Cd | L[1] | V[2] | Cr | L[1] | V[2] | Ni | L[1] | V[2] | Se | L[1] | V[2] | V | L[1] | V[2] | Zn | L[1] | V[2] | Hardness |
| IA1-55 | Toe of East Mill Dump | 0.0019 | | | 0.0054 | | | 0.0180 | | | 2.1 | | | 0.035 | | | 0.077 | | | 413 |
| | | 0.0021 | | | 0.0055 | | | 0.0190 | | | 1.9 | | | 0.035 | | | 0.082 | | | |
| IA1-28A | Sediment Ponds | 0.0011 | | | 0.0051 | | | 0.0160 | | | 1.7 | | | 0.035 | | | 0.039 | | | 382 |
| | | 0.00064 | | | 0.0055 | | | 0.0160 | | | 1.9 | | | 0.036 | | | 0.027 | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 0.00055 | | | 0.0056 | | | 0.0078 | | | 1.7 | | | 0.022 | | | 0.018 | | | 391 |
| | | 0.0006 | | | 0.0050 | | | 0.0079 | | | 1.8 | | | 0.022 | | | 0.020 | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure (Duplicate) | 0.00061 | | | 0.0047 | | | 0.0078 | | | 2.1 | | | 0.022 | | | 0.019 | | | 383 |
| | | 0.0006 | | | 0.0049 | | | 0.0080 | | | 1.8 | | | 0.022 | | | 0.019 | | | |
| **September 4, 2012** | | Cd | L[1] | V[2] | Cr | L[1] | V[2] | Ni | L[1] | V[2] | Se | L[1] | V[2] | V | L[1] | V[2] | Zn | L[1] | V[2] | Hardness |
| IA1-55 | Toe of East Mill Dump | 0.0020 | | | 0.0049 | | | 0.0170 | | | 2.0 | | | 0.034 | J+ | | 0.077 | J+ | | 415 |
| | | 0.0021 | | | 0.0050 | | | 0.0180 | | | 2.0 | | | 0.034 | J+ | | 0.077 | J+ | | |
| IA1-28A | Sediment Ponds | 0.0015 | | | 0.0049 | | | 0.0160 | | | 2.0 | | | 0.035 | J+ | | 0.048 | J+ | | 462 |
| | | 0.00086 | | | 0.0049 | | | 0.0150 | | | 2.1 | | | 0.036 | J+ | | 0.034 | J+ | | |
| IA1-28A | Sediment Ponds (Duplicate) | 0.0014 | | | 0.0051 | | | 0.0150 | | | 1.9 | | | 0.034 | J+ | | 0.046 | J+ | | 398 |
| | | 0.00083 | | | 0.0047 | | | 0.0140 | | | 2.0 | | | 0.034 | J+ | | 0.032 | J+ | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 0.00055 | | | 0.0039 | | | 0.0069 | | | 1.9 | | | 0.020 | J+ | | 0.018 | J+ | | 427 |
| | | 0.00055 | | | 0.0044 | | | 0.0071 | | | 1.9 | | | 0.022 | J+ | | 0.017 | J+ | | |
| **October 1, 2012** | | Cd | L[1] | V[2] | Cr | L[1] | V[2] | Ni | L[1] | V[2] | Se | L[1] | V[2] | V | L[1] | V[2] | Zn | L[1] | V[2] | Hardness |
| IA1-55 | Toe of East Mill Dump | 0.0023 | | | 0.0053 | | | 0.0200 | | | 2.1 | | | 0.036 | | | 0.085 | | | 632 |
| | | 0.0023 | | | 0.0049 | | | 0.0200 | | | 2.1 | | | 0.035 | | | 0.097 | | | |
| IA1-55 | Toe of East Mill Dump (Duplicate) | 0.0023 | | | 0.0052 | | | 0.0210 | | | 2.0 | | | 0.036 | | | 0.087 | | | 615 |
| | | 0.0022 | | | 0.0049 | | | 0.0190 | | | 2.1 | | | 0.035 | | | 0.083 | | | |
| IA1-28A | Sediment Ponds | 0.00076 | | | 0.0049 | | | 0.0170 | | | 2.1 | | | 0.035 | | | 0.023 | | | 516 |
| | | 0.0003 | | | 0.0048 | | | 0.0160 | | | 2.0 | | | 0.035 | | | 0.026 | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 0.00041 | | | 0.0045 | | | 0.0075 | | | 2.0 | | | 0.021 | | | 0.014 | | | 566 |
| | | 0.00031 | | | 0.0045 | | | 0.0069 | | | 2.0 | | | 0.020 | | | 0.013 | | | |

Notes:

[1]Laboratory Qualifiers: Laboratory qualifiers have not been included as all laboratory qualifiers have been evaluated in data validation and validation qualifiers applied where applicable to the data.

[2]Validation Qualifiers: The following is an explanation of the qualifiers used.

J+ Qualified as estimated for potential high bias.

Table 2-2 Inorganic Results for Surface Water Samples by Date - 2012

| Headwaters of East Mill Creek (All Results in mg/l) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cations | | | | | | | | | | | | | Anions | | | | | | | Alkalinity | | | | | | | | | | | | | | | | | | | |
| Contaminant of Concern | | Ca | L[1] | V[2] | Mg | L[1] | V[2] | K | L[1] | V[2] | Na | L[1] | V[2] | Cl | L[1] | V[2] | SO4 | L[1] | V[2] | Bicarbonate (as CaCO3) | L[1] | V[2] | Carbonate (as CaCO3) | L[1] | V[2] | Hydroxide (as CaCO3) | L[1] | V[2] | Total Alkalinity | L[1] | V[2] | | | | | | | | | |
| Location and Date | Site Description | Total | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Dissolved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| May 2, 2012 | | Ca | L[1] | V[2] | Mg | L[1] | V[2] | K | L[1] | V[2] | Na | L[1] | V[2] | Cl | L[1] | V[2] | SO4 | L[1] | V[2] | Bicarbonate (as CaCO3) | L[1] | V[2] | Carbonate (as CaCO3) | L[1] | V[2] | Hydroxide (as CaCO3) | L[1] | V[2] | Total Alkalinity | L[1] | V[2] | | | | | | | | | |
| IA1-55 | Toe of East Mill Dump | 83.2 | | | 19.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-28A | Sediment Ponds | 81.7 | | | 19.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 82.6 | | | 19.7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure (Duplicate) | 83.6 | | | 19.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| June 5, 2012 | | Ca | L[1] | V[2] | Mg | L[1] | V[2] | K | L[1] | V[2] | Na | L[1] | V[2] | Cl | L[1] | V[2] | SO4 | L[1] | V[2] | Bicarbonate (as CaCO3) | L[1] | V[2] | Carbonate (as CaCO3) | L[1] | V[2] | Hydroxide (as CaCO3) | L[1] | V[2] | Total Alkalinity | L[1] | V[2] | | | | | | | | | |
| IA1-55 | Toe of East Mill Dump | 102.0 | | | 20.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-28A | Sediment Ponds | 97.4 | | | 20.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-28A | Sediment Ponds (Duplicate) | 99.9 | | | 21.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 101.0 | | | 20.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| July 5, 2012 | | Ca | L[1] | V[2] | Mg | L[1] | V[2] | K | L[1] | V[2] | Na | L[1] | V[2] | Cl | L[1] | V[2] | SO4 | L[1] | V[2] | Bicarbonate (as CaCO3) | L[1] | V[2] | Carbonate (as CaCO3) | L[1] | V[2] | Hydroxide (as CaCO3) | L[1] | V[2] | Total Alkalinity | L[1] | V[2] | | | | | | | | | |
| IA1-55 | Toe of East Mill Dump | 108.0 | | | 23.7 | | | 1.8 | | | 5.2 | | | 3.8 | | | 194 | | | 173 | | | <2.5 | | | NA | | | 173 | | | | | | | | | | | |
| | | 116.0 | | | 23.8 | | | 1.9 | | | 5.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-55 | Toe of East Mill Dump (Duplicate) | 110.0 | | | 23.5 | | | 1.8 | | | 5.2 | | | 3.7 | | | 193 | | | 175 | | | <2.5 | | | NA | | | 175 | | | | | | | | | | | |
| | | 114.0 | | | 21.9 | | | 1.8 | | | 5.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-28A | Sediment Ponds | 98.8 | | | 23.2 | | | 1.7 | | | 5.2 | | | 4.0 | | | 189 | | | 156 | | | <2.5 | | | NA | | | 156 | | | | | | | | | | | |
| | | 107.0 | | | 22.4 | | | 1.8 | | | 5.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 103.0 | | | 23.1 | | | 1.7 | | | 5.2 | | | 3.6 | | | 188 | | | 160 | | | <2.5 | | | NA | | | 160 | | | | | | | | | | | |
| | | 111.0 | | | 23.5 | | | 1.8 | | | 5.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| August 6, 2012 | | Ca | L[1] | V[2] | Mg | L[1] | V[2] | K | L[1] | V[2] | Na | L[1] | V[2] | Cl | L[1] | V[2] | SO4 | L[1] | V[2] | Bicarbonate (as CaCO3) | L[1] | V[2] | Carbonate (as CaCO3) | L[1] | V[2] | Hydroxide (as CaCO3) | L[1] | V[2] | Total Alkalinity | L[1] | V[2] | | | | | | | | | |
| IA1-55 | Toe of East Mill Dump | 122.0 | | | 26.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-28A | Sediment Ponds | 111.0 | | | 25.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 114.0 | | | 25.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure (Duplicate) | 113.0 | | | 24.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| September 4, 2012 | | Ca | L[1] | V[2] | Mg | L[1] | V[2] | K | L[1] | V[2] | Na | L[1] | V[2] | Cl | L[1] | V[2] | SO4 | L[1] | V[2] | Bicarbonate (as CaCO3) | L[1] | V[2] | Carbonate (as CaCO3) | L[1] | V[2] | Hydroxide (as CaCO3) | L[1] | V[2] | Total Alkalinity | L[1] | V[2] | | | | | | | | | |
| IA1-55 | Toe of East Mill Dump | 123.0 | | | 25.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-28A | Sediment Ponds | 140.0 | | | 27.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-28A | Sediment Ponds (Duplicate) | 118.0 | | | 25.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 126.0 | | | 27.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| October 1, 2012 | | Ca | L[1] | V[2] | Mg | L[1] | V[2] | K | L[1] | V[2] | Na | L[1] | V[2] | Cl | L[1] | V[2] | SO4 | L[1] | V[2] | Bicarbonate (as CaCO3) | L[1] | V[2] | Carbonate (as CaCO3) | L[1] | V[2] | Hydroxide (as CaCO3) | L[1] | V[2] | Total Alkalinity | L[1] | V[2] | | | | | | | | | |
| IA1-55 | Toe of East Mill Dump | 206.0 | | | 28.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-55 | Toe of East Mill Dump (Duplicate) | 200.0 | | | 28.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-28A | Sediment Ponds | 160.0 | | | 28.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 183.0 | | | 26.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Table 2-2 Inorganic Results for Surface Water Samples by Date - 2012**

Notes:

**NA** - Not Analyzed

[1]Laboratory Qualifiers: Laboratory qualifiers have not been included as all laboratory qualifiers have been evaluated in data validation and validation qualifiers applied where applicable to the data.

[2]Validation Qualifiers: It was not necessary to apply validation qualifiers to the data shown above therefore, no validation qualifers are defined below.

Table 2-3 Field Parameters for Surface Water Samples by Date - 2012

| Sample Location | Site Description | Field Parameters | | | | | | | Flow | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Temperature | Conductivity | pH | Eh (ORP) | DO | DO | Turbidity | Flow | Flow |
| | | Degrees C | uS/cm | Std Units | mV | % | mg/L | NTU | cfs | gpm |
| **May 2, 2012** | | | | | | | | | | |
| IA1-55 | Toe of East Mill Dump | 6.39 | 381 | 6.63 | 191.2 | 75.6 | 9.30 | 1.13 | 0.299 | 134.00 |
| IA1-28A | Sediment Pond | 8.41 | 399 | 7.30 | 170.6 | 80.0 | 9.35 | 0.94 | N/A | N/A |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 8.12 | 396 | 7.94 | 170.5 | 78.7 | 9.30 | 1.25 | 0.212 | 95.00 |
| **June 5, 2012** | | | | | | | | | | |
| IA1-55 | Toe of East Mill Dump | 6.83 | 501 | 6.69 | 130.5 | 75.7 | 9.20 | 0.54 | 0.072 | 32.00 |
| IA1-28A | Sediment Pond | 13.15 | 578 | 7.56 | -200.7 | 132.1 | 13.86 | 1.95 | N/A | N/A |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 11.57 | 551 | 6.89 | 156.7 | 90.4 | 9.83 | 1.13 | 0.038 | 17.00 |
| **July 5, 2012** | | | | | | | | | | |
| IA1-55 | Toe of East Mill Dump | 7.06 | 542 | 7.04 | 191.2 | 71.8 | 8.68 | 1.46 | 0.043 | 19.00 |
| IA1-28A | Sediment Pond | 13.94 | 605 | 8.47 | 158.9 | 174.5 | 17.83 | 3.39 | N/A | N/A |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 11.97 | 594 | 6.55 | 249.3 | 69.2 | 7.42 | 1.79 | 0.013 | 5.70 |
| **August 6, 2012** | | | | | | | | | | |
| IA1-55 | Toe of East Mill Dump | 7.35 | 577 | 7.05 | 131.3 | 80.1 | 9.60 | 0.50 | 0.035 | 16.00 |
| IA1-28A | Sediment Pond | 15.50 | 650 | 8.47 | 103.9 | 151.6 | 15.11 | 8.30 | N/A | N/A |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 13.16 | 639 | 6.35 | 191.8 | 65.6 | 6.88 | 0.94 | 0.008 | 3.60 |
| **September 4, 2012** | | | | | | | | | | |
| IA1-55 | Toe of East Mill Dump | 6.99 | 613 | 7.36 | 158.0 | 70.8 | 8.55 | 0.65 | 0.030 | 14.00 |
| IA1-28A | Sediment Pond | 12.30 | 670 | 8.51 | 132.4 | 105.6 | 11.30 | 5.37 | N/A | N/A |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 10.71 | 659 | 6.56 | 226.7 | 53.6 | 5.92 | 1.55 | 0.005 | 2.10 |
| **October 1, 2012** | | | | | | | | | | |
| IA1-55 | Toe of East Mill Dump | 6.92 | 550 | 6.97 | 115.3 | 76.2 | 9.24 | 0.55 | 0.033 | 15.00 |
| IA1-28A | Sediment Pond | 10.92 | 676 | 8.49 | 96.7 | 145.8 | 16.08 | 4.70 | N/A | N/A |
| IA1-30A | East Mill Creek Below Sediment Control Structure | 11.26 | 703 | 6.81 | 146.9 | 66.5 | 7.26 | 1.63 | 0.004 | 1.80 |

N/A Not applicable, sample location IA1-28A is the sediment pond. Flow cannot be measured.

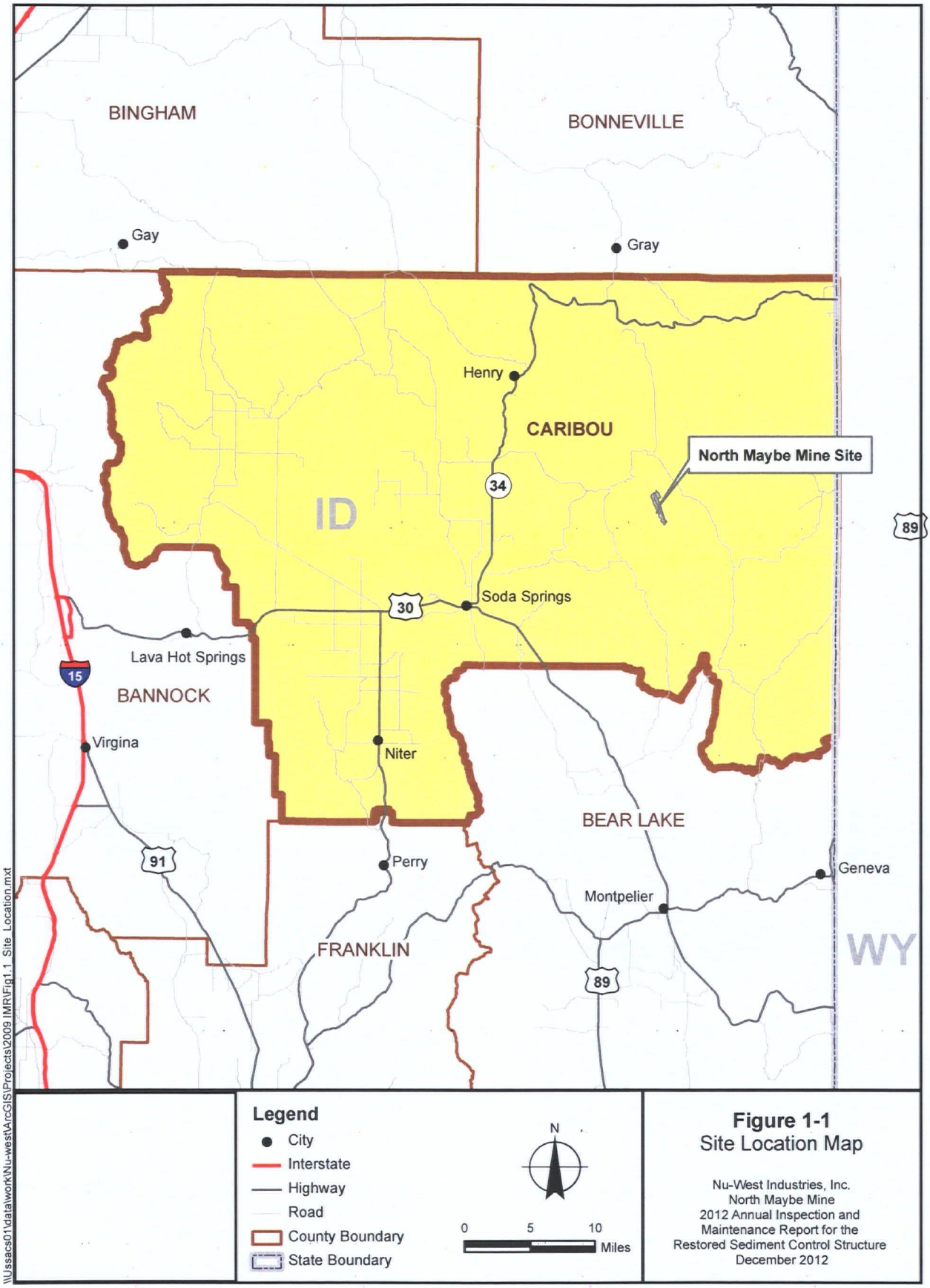
**Table 3-1 Discharge Rates for 90-degree V-Notch Weir Located Upstream of the Sediment Control Structure (IA1-55)**

| Head | FLOW RATES | | Head | FLOW RATES | | Head | FLOW RATES | |
|---|---|---|---|---|---|---|---|---|
| (Ft) | (GPM) | (CFS) | (Ft) | (GPM) | (CFS) | (Ft) | (GPM) | (CFS) |
| 0.010 | 0.0 | 0.000 | 0.345 | 80 | 0.177 | 0.680 | 435 | 0.968 |
| 0.015 | 0.0 | 0.000 | 0.350 | 83 | 0.184 | 0.685 | 443 | 0.986 |
| 0.020 | 0.1 | 0.000 | 0.355 | 86 | 0.191 | 0.690 | 451 | 1.004 |
| 0.025 | 0.1 | 0.000 | 0.360 | 89 | 0.197 | 0.695 | 459 | 1.022 |
| 0.030 | 0.2 | 0.000 | 0.365 | 92 | 0.204 | 0.700 | 467 | 1.041 |
| 0.035 | 0.3 | 0.001 | 0.370 | 95 | 0.211 | 0.705 | 476 | 1.060 |
| 0.040 | 0.4 | 0.001 | 0.375 | 98 | 0.219 | 0.710 | 484 | 1.078 |
| 0.045 | 0.5 | 0.001 | 0.380 | 101 | 0.226 | 0.715 | 493 | 1.098 |
| 0.050 | 0.6 | 0.001 | 0.385 | 105 | 0.234 | 0.720 | 501 | 1.117 |
| 0.055 | 0.8 | 0.002 | 0.390 | 108 | 0.241 | 0.725 | 510 | 1.136 |
| 0.060 | 1.0 | 0.002 | 0.395 | 112 | 0.249 | 0.730 | 519 | 1.156 |
| 0.065 | 1.2 | 0.003 | 0.400 | 115 | 0.257 | 0.735 | 528 | 1.176 |
| 0.070 | 1.5 | 0.003 | 0.405 | 119 | 0.265 | 0.740 | 537 | 1.196 |
| 0.075 | 1.8 | 0.004 | 0.410 | 123 | 0.273 | 0.745 | 546 | 1.216 |
| 0.080 | 2.1 | 0.005 | 0.415 | 126 | 0.282 | 0.750 | 555 | 1.237 |
| 0.085 | 2.4 | 0.005 | 0.420 | 130 | 0.290 | 0.755 | 565 | 1.258 |
| 0.090 | 2.8 | 0.006 | 0.425 | 134 | 0.299 | 0.760 | 574 | 1.278 |
| 0.095 | 3.2 | 0.007 | 0.430 | 138 | 0.308 | 0.765 | 584 | 1.300 |
| 0.100 | 3.6 | 0.008 | 0.435 | 142 | 0.317 | 0.770 | 593 | 1.321 |
| 0.105 | 4.1 | 0.009 | 0.440 | 146 | 0.326 | 0.775 | 603 | 1.342 |
| 0.110 | 4.6 | 0.010 | 0.445 | 151 | 0.335 | 0.780 | 613 | 1.364 |
| 0.115 | 5.1 | 0.011 | 0.450 | 155 | 0.345 | 0.785 | 622 | 1.386 |
| 0.120 | 5.7 | 0.013 | 0.455 | 159 | 0.355 | 0.790 | 632 | 1.408 |
| 0.125 | 6.3 | 0.014 | 0.460 | 164 | 0.364 | 0.795 | 642 | 1.431 |
| 0.130 | 6.9 | 0.015 | 0.465 | 168 | 0.374 | 0.800 | 653 | 1.453 |
| 0.135 | 7.6 | 0.017 | 0.470 | 173 | 0.384 | 0.805 | 663 | 1.476 |
| 0.140 | 8.4 | 0.019 | 0.475 | 177 | 0.395 | 0.810 | 673 | 1.499 |
| 0.145 | 9.1 | 0.020 | 0.480 | 182 | 0.405 | 0.815 | 684 | 1.522 |
| 0.150 | 9.9 | 0.022 | 0.485 | 187 | 0.416 | 0.820 | 694 | 1.546 |
| 0.155 | 11 | 0.024 | 0.490 | 192 | 0.427 | 0.825 | 705 | 1.570 |
| 0.160 | 12 | 0.026 | 0.495 | 197 | 0.438 | 0.830 | 715 | 1.593 |
| 0.165 | 13 | 0.028 | 0.500 | 202 | 0.449 | 0.835 | 726 | 1.618 |
| 0.170 | 14 | 0.030 | 0.505 | 207 | 0.460 | 0.840 | 737 | 1.642 |
| 0.175 | 15 | 0.033 | 0.510 | 212 | 0.472 | 0.845 | 748 | 1.666 |
| 0.180 | 16 | 0.035 | 0.515 | 217 | 0.483 | 0.850 | 759 | 1.691 |
| 0.185 | 17 | 0.037 | 0.520 | 222 | 0.495 | 0.855 | 771 | 1.716 |
| 0.190 | 18 | 0.040 | 0.525 | 228 | 0.507 | 0.860 | 782 | 1.741 |
| 0.195 | 19 | 0.043 | 0.530 | 233 | 0.519 | 0.865 | 793 | 1.767 |
| 0.200 | 20 | 0.045 | 0.535 | 239 | 0.532 | 0.870 | 805 | 1.792 |
| 0.205 | 22 | 0.048 | 0.540 | 244 | 0.544 | 0.875 | 816 | 1.818 |
| 0.210 | 23 | 0.051 | 0.545 | 250 | 0.557 | 0.880 | 828 | 1.844 |
| 0.215 | 24 | 0.054 | 0.550 | 256 | 0.570 | 0.885 | 840 | 1.871 |
| 0.220 | 26 | 0.058 | 0.555 | 262 | 0.583 | 0.890 | 852 | 1.897 |
| 0.225 | 27 | 0.061 | 0.560 | 268 | 0.596 | 0.895 | 864 | 1.924 |
| 0.230 | 29 | 0.064 | 0.565 | 274 | 0.609 | 0.900 | 876 | 1.951 |
| 0.235 | 31 | 0.068 | 0.570 | 280 | 0.623 | 0.905 | 888 | 1.978 |
| 0.240 | 32 | 0.072 | 0.575 | 286 | 0.637 | 0.910 | 901 | 2.006 |
| 0.245 | 34 | 0.075 | 0.580 | 292 | 0.650 | 0.915 | 913 | 2.033 |
| 0.250 | 36 | 0.079 | 0.585 | 298 | 0.665 | 0.920 | 925 | 2.061 |
| 0.255 | 37 | 0.083 | 0.590 | 305 | 0.679 | 0.925 | 938 | 2.089 |
| 0.260 | 39 | 0.088 | 0.595 | 311 | 0.693 | 0.930 | 951 | 2.118 |
| 0.265 | 41 | 0.092 | 0.600 | 318 | 0.708 | 0.935 | 964 | 2.146 |
| 0.270 | 43 | 0.096 | 0.605 | 325 | 0.723 | 0.940 | 977 | 2.175 |
| 0.275 | 45 | 0.101 | 0.610 | 331 | 0.738 | 0.945 | 990 | 2.204 |
| 0.280 | 47 | 0.105 | 0.615 | 338 | 0.753 | 0.950 | 1003 | 2.233 |
| 0.285 | 49 | 0.110 | 0.620 | 345 | 0.768 | 0.955 | 1016 | 2.263 |
| 0.290 | 52 | 0.115 | 0.625 | 352 | 0.784 | 0.960 | 1029 | 2.293 |
| 0.295 | 54 | 0.120 | 0.630 | 359 | 0.800 | 0.965 | 1043 | 2.323 |
| 0.300 | 56 | 0.125 | 0.635 | 366 | 0.816 | 0.970 | 1056 | 2.353 |
| 0.305 | 59 | 0.130 | 0.640 | 374 | 0.832 | 0.975 | 1070 | 2.383 |
| 0.310 | 61 | 0.136 | 0.645 | 381 | 0.848 | 0.980 | 1084 | 2.414 |
| 0.315 | 63 | 0.141 | 0.650 | 388 | 0.865 | 0.985 | 1098 | 2.445 |
| 0.320 | 66 | 0.147 | 0.655 | 396 | 0.882 | 0.990 | 1112 | 2.476 |
| 0.325 | 69 | 0.153 | 0.660 | 403 | 0.898 | 0.995 | 1126 | 2.507 |
| 0.330 | 71 | 0.159 | 0.665 | 411 | 0.916 | 1.000 | 1140 | 2.539 |
| 0.335 | 74 | 0.165 | 0.670 | 419 | 0.933 | | | |
| 0.340 | 77 | 0.171 | 0.675 | 427 | 0.950 | | | |

**Table 3-2 Discharge rates for 90-degree V-Notch Weir Located Downstream of the Sediment Control Structure (IA1-30A)**

| Head | FLOW RATES | | Head | FLOW RATES | | Head | FLOW RATES | |
|---|---|---|---|---|---|---|---|---|
| (Ft) | GPM | CFS | (Ft) | GPM | CFS | (Ft) | GPM | CFS |
| 0.010 | 0.0 | 0.000 | 0.345 | 80 | 0.178 | 0.680 | 437 | 0.973 |
| 0.015 | 0.0 | 0.000 | 0.350 | 83 | 0.185 | 0.685 | 445 | 0.991 |
| 0.020 | 0.1 | 0.000 | 0.355 | 86 | 0.192 | 0.690 | 453 | 1.009 |
| 0.025 | 0.1 | 0.000 | 0.360 | 89 | 0.198 | 0.695 | 461 | 1.027 |
| 0.030 | 0.2 | 0.000 | 0.365 | 92 | 0.205 | 0.700 | 470 | 1.046 |
| 0.035 | 0.3 | 0.001 | 0.370 | 95 | 0.212 | 0.705 | 478 | 1.065 |
| 0.040 | 0.4 | 0.001 | 0.375 | 99 | 0.220 | 0.710 | 487 | 1.084 |
| 0.045 | 0.5 | 0.001 | 0.380 | 102 | 0.227 | 0.715 | 495 | 1.103 |
| 0.050 | 0.6 | 0.001 | 0.385 | 105 | 0.235 | 0.720 | 504 | 1.122 |
| 0.055 | 0.8 | 0.002 | 0.390 | 109 | 0.242 | 0.725 | 513 | 1.142 |
| 0.060 | 1.0 | 0.002 | 0.395 | 112 | 0.250 | 0.730 | 522 | 1.162 |
| 0.065 | 1.2 | 0.003 | 0.400 | 116 | 0.258 | 0.735 | 531 | 1.182 |
| 0.070 | 1.5 | 0.003 | 0.405 | 120 | 0.266 | 0.740 | 540 | 1.202 |
| 0.075 | 1.8 | 0.004 | 0.410 | 123 | 0.275 | 0.745 | 549 | 1.222 |
| 0.080 | 2.1 | 0.005 | 0.415 | 127 | 0.283 | 0.750 | 558 | 1.243 |
| 0.085 | 2.4 | 0.005 | 0.420 | 131 | 0.292 | 0.755 | 567 | 1.264 |
| 0.090 | 2.8 | 0.006 | 0.425 | 135 | 0.300 | 0.760 | 577 | 1.285 |
| 0.095 | 3.2 | 0.007 | 0.430 | 139 | 0.309 | 0.765 | 586 | 1.306 |
| 0.100 | 3.6 | 0.008 | 0.435 | 143 | 0.318 | 0.770 | 596 | 1.328 |
| 0.105 | 4.1 | 0.009 | 0.440 | 147 | 0.328 | 0.775 | 606 | 1.349 |
| 0.110 | 4.6 | 0.010 | 0.445 | 151 | 0.337 | 0.780 | 616 | 1.371 |
| 0.115 | 5.1 | 0.011 | 0.450 | 156 | 0.347 | 0.785 | 626 | 1.393 |
| 0.120 | 5.7 | 0.013 | 0.455 | 160 | 0.356 | 0.790 | 636 | 1.415 |
| 0.125 | 6.3 | 0.014 | 0.460 | 164 | 0.366 | 0.795 | 646 | 1.438 |
| 0.130 | 7.0 | 0.016 | 0.465 | 169 | 0.376 | 0.800 | 656 | 1.461 |
| 0.135 | 7.7 | 0.017 | 0.470 | 174 | 0.386 | 0.805 | 666 | 1.484 |
| 0.140 | 8.4 | 0.019 | 0.475 | 178 | 0.397 | 0.810 | 677 | 1.507 |
| 0.145 | 9.2 | 0.020 | 0.480 | 183 | 0.407 | 0.815 | 687 | 1.530 |
| 0.150 | 10.0 | 0.022 | 0.485 | 188 | 0.418 | 0.820 | 698 | 1.554 |
| 0.155 | 11 | 0.024 | 0.490 | 193 | 0.429 | 0.825 | 708 | 1.577 |
| 0.160 | 12 | 0.026 | 0.495 | 198 | 0.440 | 0.830 | 719 | 1.601 |
| 0.165 | 13 | 0.028 | 0.500 | 203 | 0.451 | 0.835 | 730 | 1.626 |
| 0.170 | 14 | 0.030 | 0.505 | 208 | 0.462 | 0.840 | 741 | 1.650 |
| 0.175 | 15 | 0.033 | 0.510 | 213 | 0.474 | 0.845 | 752 | 1.675 |
| 0.180 | 16 | 0.035 | 0.515 | 218 | 0.486 | 0.850 | 763 | 1.700 |
| 0.185 | 17 | 0.038 | 0.520 | 223 | 0.498 | 0.855 | 774 | 1.725 |
| 0.190 | 18 | 0.040 | 0.525 | 229 | 0.510 | 0.860 | 786 | 1.750 |
| 0.195 | 19 | 0.043 | 0.530 | 234 | 0.522 | 0.865 | 797 | 1.776 |
| 0.200 | 20 | 0.046 | 0.535 | 240 | 0.534 | 0.870 | 809 | 1.801 |
| 0.205 | 22 | 0.049 | 0.540 | 245 | 0.547 | 0.875 | 821 | 1.827 |
| 0.210 | 23 | 0.052 | 0.545 | 251 | 0.560 | 0.880 | 832 | 1.854 |
| 0.215 | 25 | 0.055 | 0.550 | 257 | 0.572 | 0.885 | 844 | 1.880 |
| 0.220 | 26 | 0.058 | 0.555 | 263 | 0.586 | 0.890 | 856 | 1.907 |
| 0.225 | 28 | 0.061 | 0.560 | 269 | 0.599 | 0.895 | 868 | 1.934 |
| 0.230 | 29 | 0.065 | 0.565 | 275 | 0.612 | 0.900 | 880 | 1.961 |
| 0.235 | 31 | 0.068 | 0.570 | 281 | 0.626 | 0.905 | 893 | 1.988 |
| 0.240 | 32 | 0.072 | 0.575 | 287 | 0.640 | 0.910 | 905 | 2.016 |
| 0.245 | 34 | 0.076 | 0.580 | 294 | 0.654 | 0.915 | 918 | 2.043 |
| 0.250 | 36 | 0.080 | 0.585 | 300 | 0.668 | 0.920 | 930 | 2.071 |
| 0.255 | 38 | 0.084 | 0.590 | 306 | 0.682 | 0.925 | 943 | 2.100 |
| 0.260 | 39 | 0.088 | 0.595 | 313 | 0.697 | 0.930 | 956 | 2.128 |
| 0.265 | 41 | 0.092 | 0.600 | 319 | 0.712 | 0.935 | 968 | 2.157 |
| 0.270 | 43 | 0.097 | 0.605 | 326 | 0.726 | 0.940 | 981 | 2.186 |
| 0.275 | 45 | 0.101 | 0.610 | 333 | 0.742 | 0.945 | 995 | 2.215 |
| 0.280 | 48 | 0.106 | 0.615 | 340 | 0.757 | 0.950 | 1008 | 2.245 |
| 0.285 | 50 | 0.111 | 0.620 | 347 | 0.772 | 0.955 | 1021 | 2.274 |
| 0.290 | 52 | 0.116 | 0.625 | 354 | 0.788 | 0.960 | 1035 | 2.304 |
| 0.295 | 54 | 0.121 | 0.630 | 361 | 0.804 | 0.965 | 1048 | 2.334 |
| 0.300 | 56 | 0.126 | 0.635 | 368 | 0.820 | 0.970 | 1062 | 2.365 |
| 0.305 | 59 | 0.131 | 0.640 | 375 | 0.836 | 0.975 | 1075 | 2.395 |
| 0.310 | 61 | 0.137 | 0.645 | 383 | 0.853 | 0.980 | 1089 | 2.426 |
| 0.315 | 64 | 0.142 | 0.650 | 390 | 0.869 | 0.985 | 1103 | 2.457 |
| 0.320 | 66 | 0.148 | 0.655 | 398 | 0.886 | 0.990 | 1117 | 2.488 |
| 0.325 | 69 | 0.154 | 0.660 | 405 | 0.903 | 0.995 | 1131 | 2.520 |
| 0.330 | 72 | 0.160 | 0.665 | 413 | 0.920 | 1.000 | 1146 | 2.552 |
| 0.335 | 74 | 0.166 | 0.670 | 421 | 0.938 | | | |
| 0.340 | 77 | 0.172 | 0.675 | 429 | 0.955 | | | |

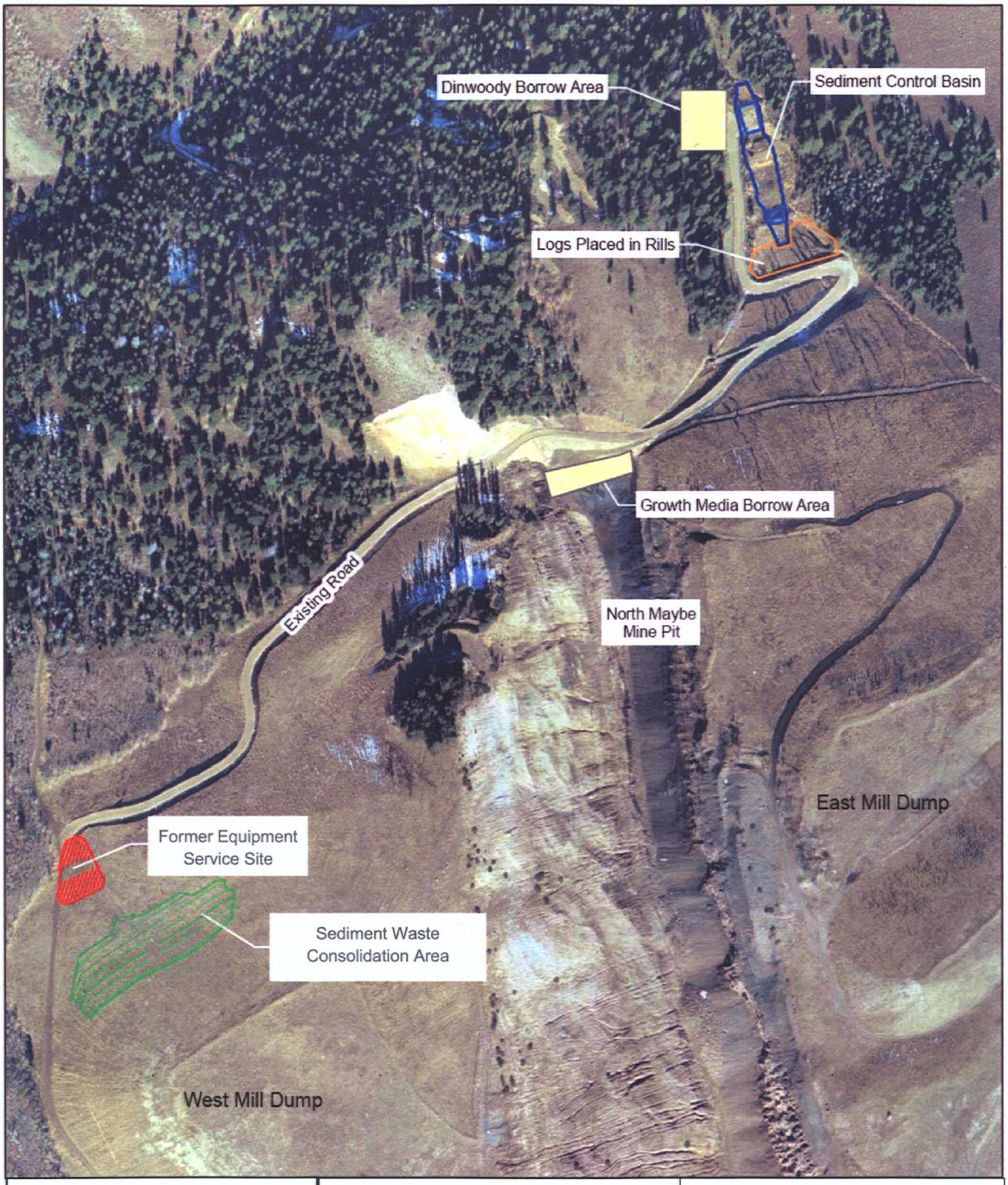
# FIGURES




\\Ussacs01\data\work\Nu-west\ArcGIS\Projects\2009 IMR\Fig1.1 Site Location.mxt

**Figure 1-1**
Site Location Map

Nu-West Industries, Inc.
North Maybe Mine
2012 Annual Inspection and
Maintenance Report for the
Restored Sediment Control Structure
December 2012



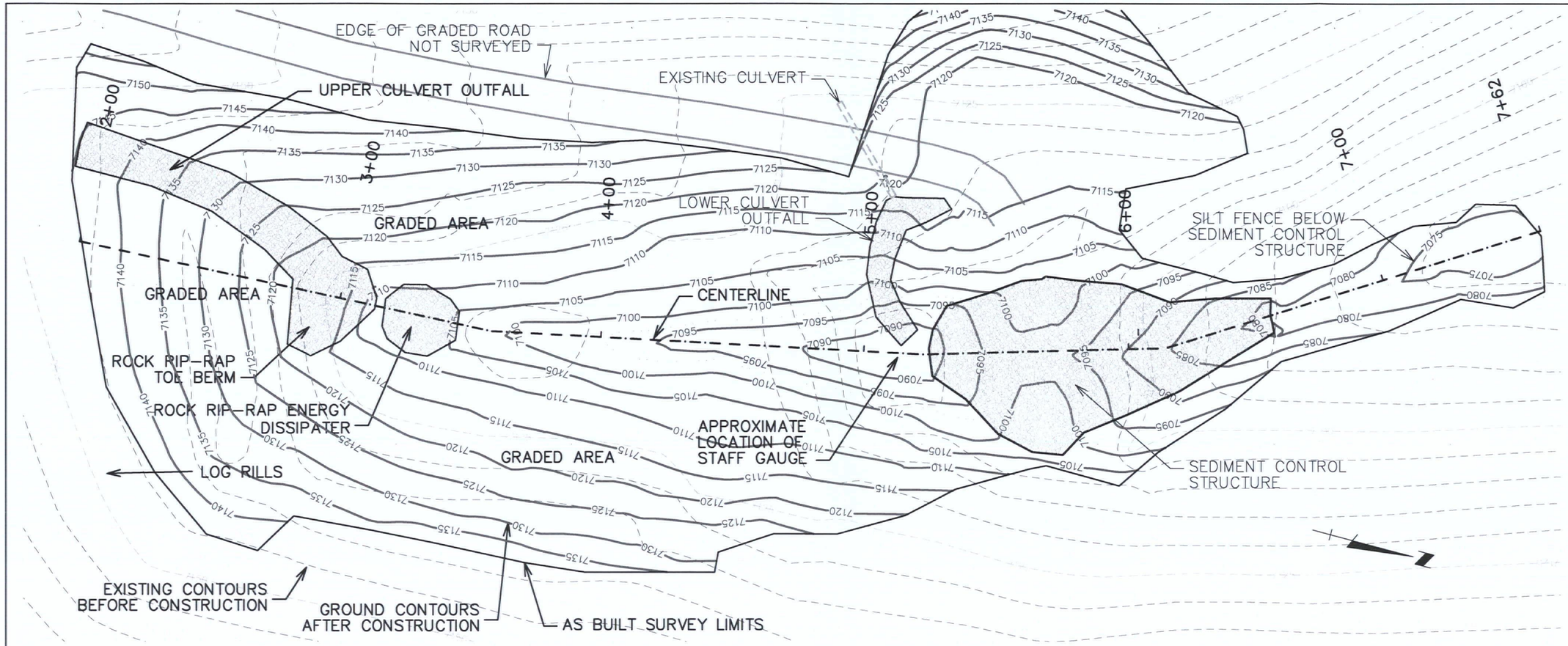

Aerial Photo: October 31, 2007

0 200 400 Feet

N

**Figure 2-1**
**Sediment Control Structure Restoration Plan View**

Nu-West Industries, Inc.
North Maybe Mine - 2012 Annual Inspection and Maintenance Report
December 2012



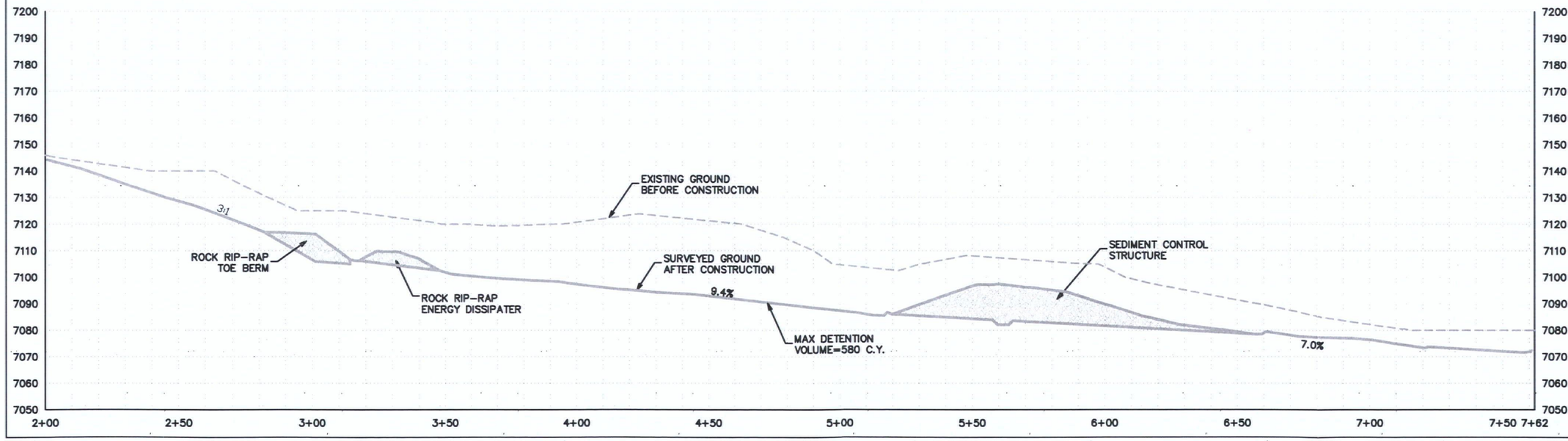




**Figure 2-2**
Plan and Profile from As-Built Survey

Nu-West Industries, Inc.
North Maybe Mine
2012 Annual Inspection and Maintenance Report for the
Restored Sediment control Structure
December 2012

0 20 40

LEGEND
- EXISTING CONTOURS BEFORE CONSTRUCTION
- GROUND CONTOURS AFTER CONSTRUCTION
- ROCK RIP-RAP
- SURVEY LIMITS
- APPROXIMATE FLOWLINE CENTERLINE


**Legend**

- Pond
- Spring

N

0 2,250 Feet

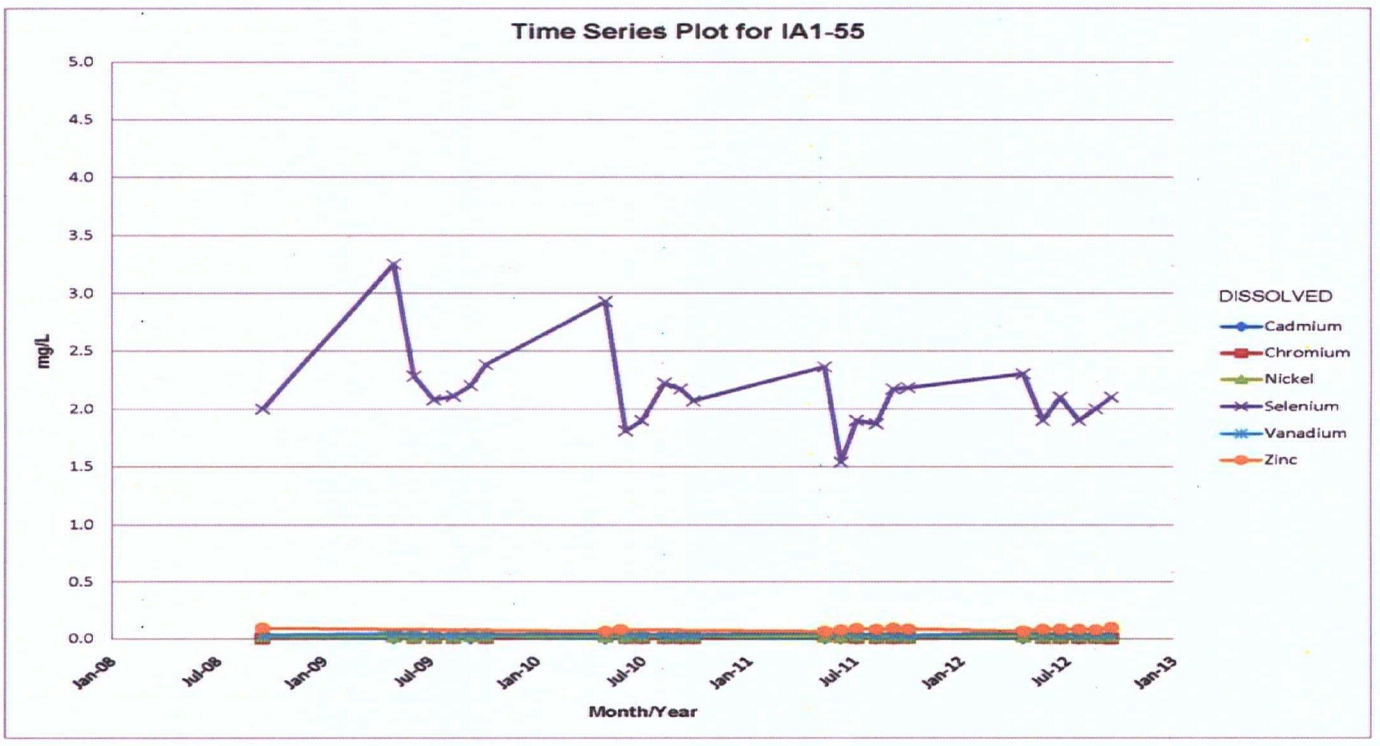
**Figure 2-3**

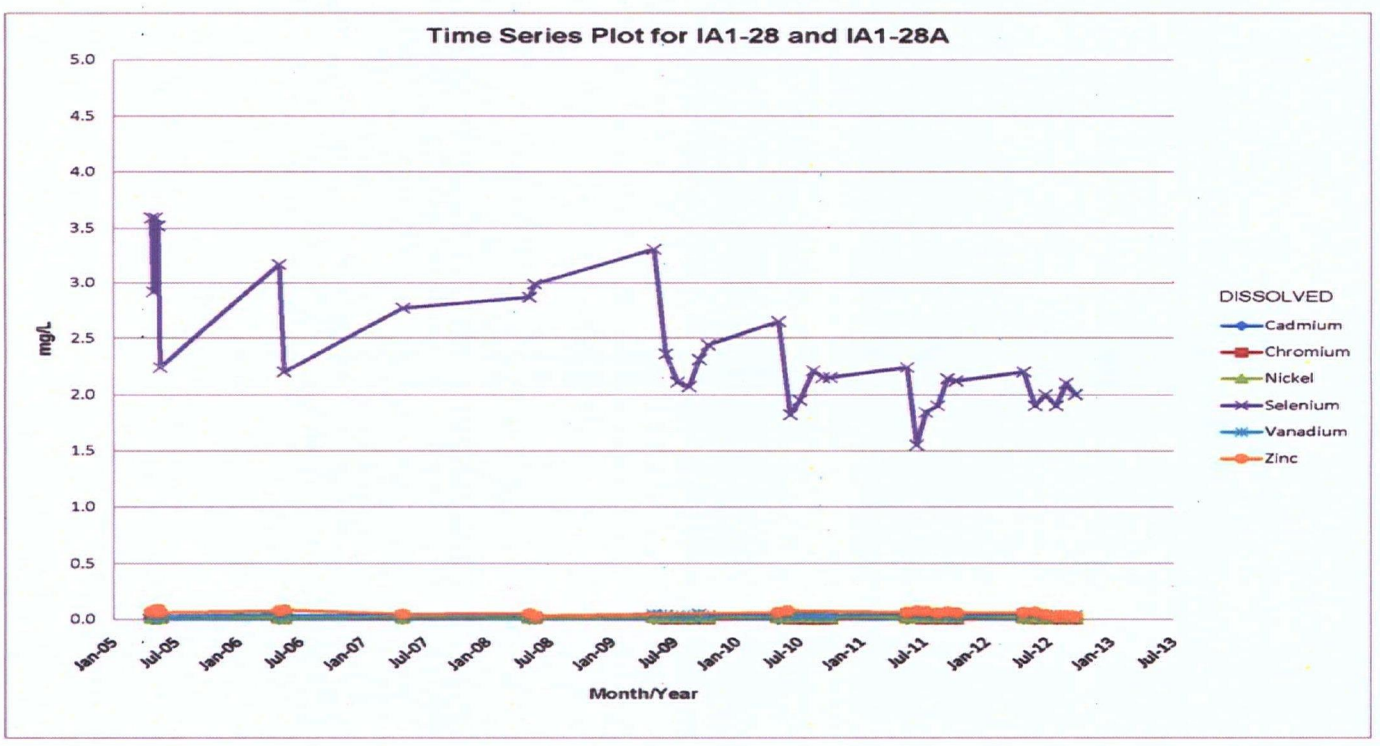
Surface Water Sampling Locations

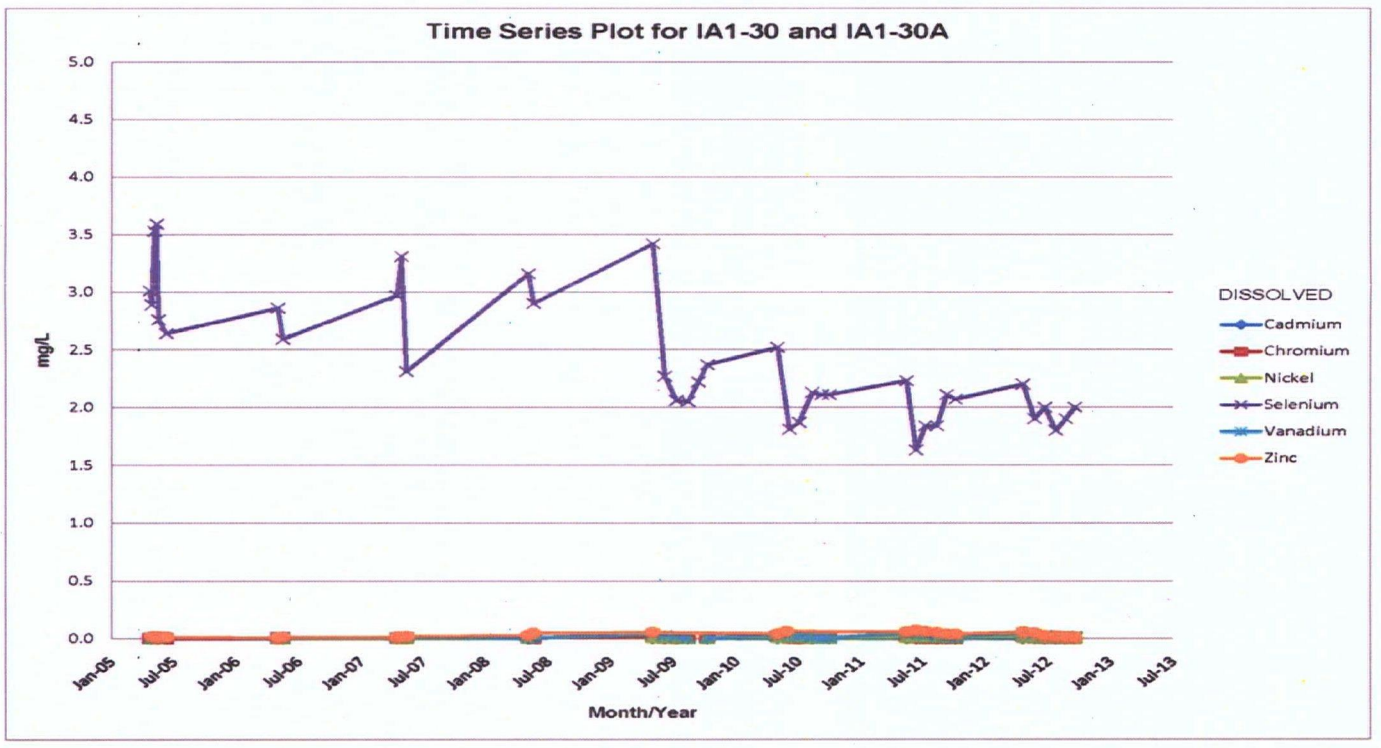
Nu-West Industries, Inc.
North Maybe Mine
2012 Annual Inspection and
Maintenance Report for the
Restored Sediment Control Structure
December 2012

\\Ussacs01\data\work\Nu-west\ArcGIS\Projects\2010 IMR\Fig2-2_SW_Locations.mxt

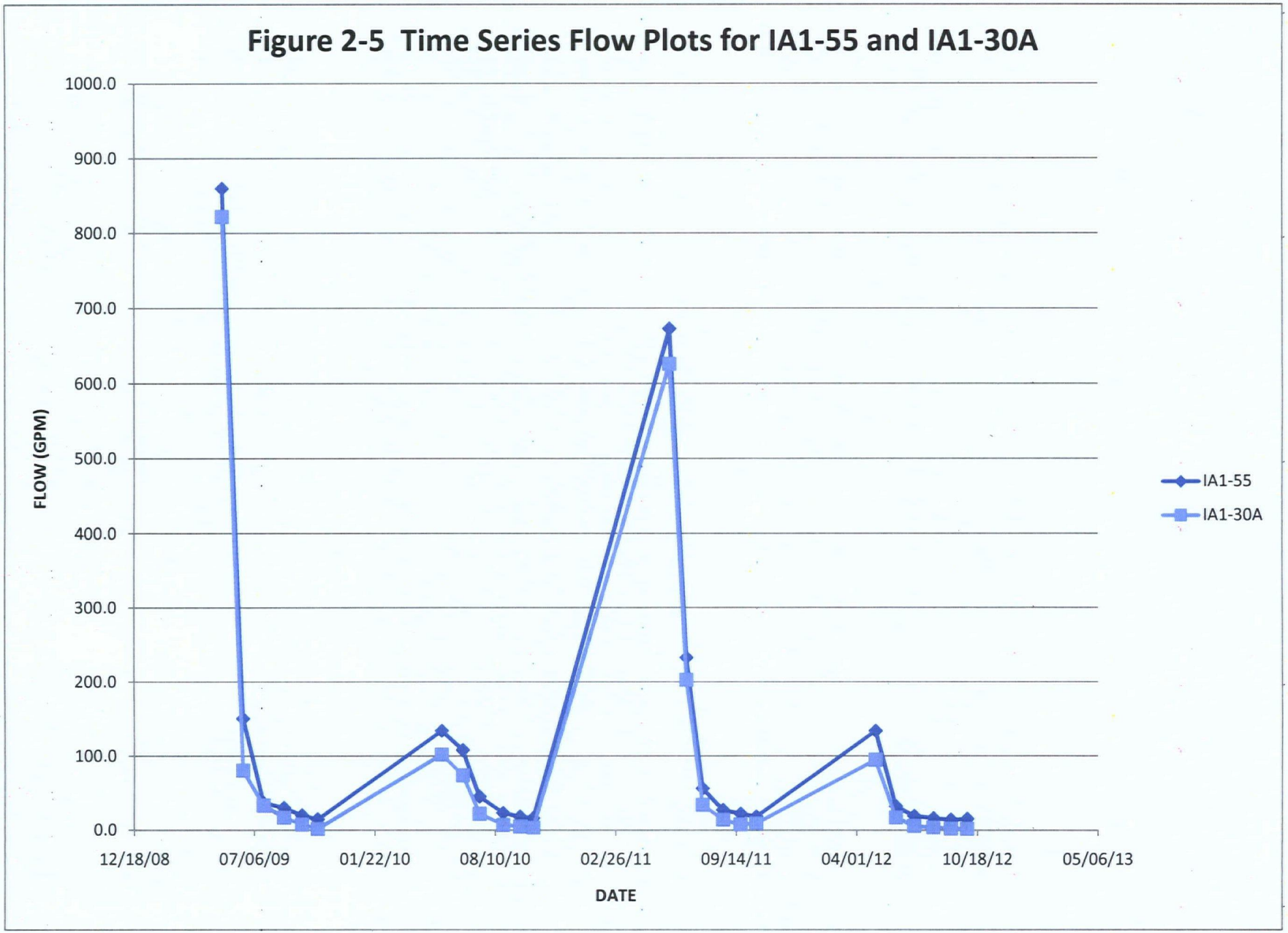
**Figure 2-4 Time Series Plots for IA1-55, IA1-28/28A and IA1-30/30A**



## Figure 2-5 Time Series Flow Plots for IA1-55 and IA1-30A



# APPENDIX A
# NORTH MAYBE MINE TCRA SITE INSPECTION FORMS AND PHOTOGRAPHS

**INSPECTION FORMS AND PHOTOS**

**MAY 2, 2012**

**East Mill Creek Sediment Control Structure Site Inspection Form**
**Page *1 of 3***

| **General Information** | |
|---|---|
| **Inspector's Name:** JAMES B. WILLIAMS | |
| **Date:** MAY 02, 2012 | **Start Time:** 1345 |
| **Monthly Surface Water Sampling Event?:** ☑ Yes ☐ No | |
| **Type of Monitoring:** ☑ Regular (Monthly) ☐ Post-storm event | |
| **Has there been a storm event since the last inspection?** ☑ Yes ☐ No<br>If Yes - Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):<br>FIRST INSPECTION OF THE YEAR/SEASON. THERE HAVE BEEN MANY STORMS SINCE THE LAST INSPECTION OF OCT. 2011. | |
| **Weather at time of this inspection?** ☐ Clear ☑ Cloudy ☐ Rain ☐ Fog ☐ Snow ☑ Windy<br>Temperature: 46 °F Description: COOL, WINDY, SPRING DAY | |
| **Approximate staff gauge reading & flow rate at the weir located at the Toe of East Mill Dump, above the sediment control structure (IA1-55):**<br>0.425 Staff Gauge Reading (feet) 134 Corresponding Flow Rate (gallons per minute) | |
| **Approximate staff gauge reading & flow rate at the weir located in East Mill Creek at toe of sediment control structure (IA1-30A):**<br>0.370 Staff Gauge Reading (feet) 95 Corresponding Flow Rate (gallons per minute)<br>**Has the flow increased or decreased since the last site inspection?** ☑ Yes ☐ No **If yes, describe:** INCREASED SIGNIFICANTLY SINCE LAST FALL (OCT. 2011) | |
| **Is any water flowing through the spillway in the Sediment Control Structure?** ☑ Yes ☐ No **If yes, describe:**<br>FLOWING THROUGH COARSE RIPRAP OF THE SPILLWAY. | |

**Surface Water Sampling: Monthly (May-Oct.)**

Note, if samples are collected attach a copy of the completed "Field Water Quality Sampling Form" to this Inspection Form for each sample location. These forms can be found in the 2009 Groundwater and Surface Water Sampling Work Plan for North Maybe Mine.

| | **Toe of East Mill Dump Cross Valley Fill (IA1-55)** | **Sediment Pond (IA1-28A)** | **East Mill Creek (IA1-30A)** |
|---|---|---|---|
| **Sample Collected?** | ☑ Yes ☐ No | ☑ Yes ☐ No | ☑ Yes ☐ No |

**Depth of Sediment at Staff Gauge in Sediment Pond (Feet):** NO ACCUMULATION OF SEDIMENT
**Water level in Sediment Pond (Feet):** 9.17 ON STAFF
**Clarity (Feet):** 9 FT - CAN SEE BOTTOM OF THE POND.

**East Mill Creek Sediment Control Structure Site Inspection Form**


| **Monitoring: Once Per Month, After Storm Events ≥ 2.64" in 24 Hour Period (100-Year, 24-Hour Storm Event), and After Storm Events ≥ 0.8" in a 1 Hour Period (25-Year, 1-Hour Storm Event) (May-Oct.)** | | | | |
|---|---|---|---|---|
| **Location** | **BMP** | **BMP Functionality** | **BMP Functioning Properly?** | **Corrective Action Needed/Notes** |
| EMD Sediment Pond | Graded Area Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Riprap below Culvert Outfalls | ✓ Riprap is in-place (i.e., not washed away)<br>✓ No soil washed out from under riprap<br>✓ No diversion of runoff flow around riprap resulting in additional rill erosion | ☑ Yes<br>☐ No | NO EVIDENCE OF HEAVY RUNOFF THIS SPRING. |
| EMD Sediment Pond | Riprap Energy Dissipater | ✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure<br>✓ Pore spaces within sediment control structure remains unblocked | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Sediment Control Structure | ✓ Depth of sediment at staff gauge in the sediment pond is less than 7.0 feet<br>✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure<br>✓ Soil is in-place (i.e., not washed away)<br>✓ No animal burrow holes or tree growth<br>✓ No washing away of the soil used to construct the sediment control structure,<br>✓ No erosion of the upper reach of East Mill Creek caused by water flowing over the spillway and down the face of the sediment control structure.<br>✓ Pore spaces within sediment control structure remains unblocked<br>✓ No erosion on the downstream side where seep occurs at the toe of the sediment control structure (note turbidity of seep water, and flow rate of seep, if possible) | ☑ Yes<br>☐ No | |

**East Mill Creek Sediment Control Structure Site Inspection Form**
**Page *3 of 3***

| **Monitoring: Once Per Month, After Storm Events ≥ 2.64" in 24 Hour Period (100-Year, 24-Hour Storm Event), and After Storm Events ≥ 0.8" in a 1 Hour Period (25-Year, 1-Hour Storm Event) (May-Oct.)** | | | | |
|---|---|---|---|---|
| **Location** | **BMP** | **BMP Functionality** | **BMP Functioning Properly?** | **Corrective Action Needed/Notes** |
| EMD Toe | Riprap Toe Berm | ✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure | ☑ Yes<br>☐ No | SOME SNOW STILL COVERING THIS AREA. APPEARS OK. |
| EMD Rills | Erosion Controls | ✓ Logs are in-place in rills (i.e., not washed away)<br>✓ Rills are not increasing in size (i.e., no additional erosion is occurring) | ☑ Yes<br>☐ No | |
| Growth Media Borrow Area | Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |
| West Mill Dump Soil Consolidation Area | Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |

**Comments:**
THE SITE IS STABLE AND HAS HANDLED/IS HANDLING THE SPRING RUNOFF WELL. MOST ROADSIDE DITCHES ARE STILL FILLED WITH SNOWBANKS. NO SIGN OF HEAVY RUNOFF THIS YEAR.

Note:
* Document when vegetation is at 70% permanent cover under the "Corrective Action Needed/Notes" column.

**Print Name & Title:** JAMES B. WILLIAMS - INSPECTOR **End Time:** 1530

**Signature:** James B. Williams **Date:** 05/02/12

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – MAY 2, 2012


Photo taken looking north, showing the graded area surrounding the sediment pond, riprap below culvert outfalls, riprap energy dissipater, riprap toe berm, logs placed in rills on East Mill Dump and the sediment control structure.


Photo taken looking south, showing that some portions of the graded area surrounding the sediment pond, the riprap energy dissipater and the riprap toe berm are partially covered with snow.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – MAY 2, 2012


Photo taken looking north, showing the upper V-notch weir, and the sediment control structure.


This photo shows the toe of the riprap energy dissipater looking south. This photo shows the riprap energy dissipater is in good condition.


Photo taken looking southwest, showing the riprap toe berm and riprap below the upper culvert. Some snow remaining.


Photo taken looking southeast, showing the riprap below the upper culvert and logs in rills on East Mill Dump. Logs in rills are slightly snow covered.


Photo taken looking east, showing the lower culvert riprap outfall (right foreground) and the clarity of the sediment control pond.


Photo taken looking north, from the top of the sediment control structure showing the lower weir and riprap lined channel below the sediment control structure.


Photo taken looking north, showing a close up of the riprap lined channel below the sediment control structure. This area is stable and in good condition.


Photo taken looking south, showing the riprap lined channel below the sediment control structure and the lower weir. The riprap channel is in good condition.


Photo taken looking south of the lower weir and sediment control structure. This area is stable and in good condition.


Photo taken looking south, showing the waste consolidation area. Area is free of snow with no evidence of erosion.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – MAY 2, 2012


Photo taken looking southeast, showing the waste consolidation area. Area is free of snow with no evidence of erosion.


Photo taken looking east, showing the upper access road. Road and ditch are still partially snow covered.


Photo taken looking east, showing the access road along the North Maybe Pit end wall. Some rock has rolled into the ditch but still maintains a flow line.


Photo taken looking east, showing the lower portion of the access road. Ditch is still partially snow covered.


Photo taken looking west, showing the lower portion of the access road. Ditch is still partially snow covered.


Photo taken looking west, showing the growth media borrow area located at the north end of the pit. This area is holding up well showing no signs of erosion.

**INSPECTION FORMS AND PHOTOS**

**JUNE 5, 2012**

**East Mill Creek Sediment Control Structure Site Inspection Form**


## General Information

**Inspector's Name:** JAMES B. WILLIAMS

**Date:** JUNE 05, 2012 **Start Time:** 1230

**Monthly Surface Water Sampling Event?:** ☑ Yes ☐ No

**Type of Monitoring:** ☑ Regular (Monthly) ☐ Post-storm event

**Has there been a storm event since the last inspection?** ☑ Yes ☐ No STORMS OVER 0.10"/DAY NOTED BELOW:

| If Yes - Storm Start Date & Time: | Storm Duration (hrs): | Approximate Amount of Precipitation (in): |
|---|---|---|
| 05/03 16:03 | 2 HR 4 MIN | 0.11" |
| 05/04 0:23 | 13 HR 25 MIN | 0.26" |
| 05/05 9:34 | 1 HR 6 MIN | 0.11" |
| 05/18 0:02 | 11 HR 44 MIN | 0.21" |
| 05/24 9:19 | 2 HR 23 MIN | 0.17" |
| 05/26 13:00 | 10 HR 0 MIN | 0.28" |
| 05/27 4:01 | 19 HR 41 MIN | 0.50" |
| 05/28 0:59 | 16 HR 30 MIN | 0.21" |

**Weather at time of this inspection?** ☑ Clear ☐ Cloudy ☐ Rain ☐ Fog ☐ Snow ☐ Windy

Temperature: 59° F Description: CLEAR, SUNNY DAY, FAIRLY WARM. CLOUDS ROLLED IN LATER IN THE DAY AND THE TEMP DROPPED TO 50° F.

**Approximate staff gauge reading & flow rate at the weir located at the Toe of East Mill Dump, above the sediment control structure (IA1-55):**

0.240' Staff Gauge Reading (feet) 32 Corresponding Flow Rate (gallons per minute)

**Approximate staff gauge reading & flow rate at the weir located in East Mill Creek at toe of sediment control structure (IA1-30A):**

0.185' Staff Gauge Reading (feet) 17 Corresponding Flow Rate (gallons per minute)

**Has the flow increased or decreased since the last site inspection?** ☑ Yes ☐ No **If yes, describe:** DECREASED:

BY 102 GPM AT IA1-55, BY 78 GPM AT IA1-30A.

**Is any water flowing through the spillway in the Sediment Control Structure?** ☑ Yes ☐ No **If yes, describe:**

FLOWING THROUGH COARSE RIPRAP OVER THE SPILLWAY.

## Surface Water Sampling: Monthly (May-Oct.)

Note, if samples are collected attach a copy of the completed "Field Water Quality Sampling Form" to this Inspection Form for each sample location. These forms can be found in the 2009 Groundwater and Surface Water Sampling Work Plan for North Maybe Mine.

| | Toe of East Mill Dump Cross Valley Fill (IA1-55) | Sediment Pond (IA1-28A) | East Mill Creek (IA1-30A) |
|---|---|---|---|
| **Sample Collected?** | ☑ Yes ☐ No | ☑ Yes ☐ No | ☑ Yes ☐ No |

**Depth of Sediment at Staff Gauge in Sediment Pond (Feet):** NO ACCUMULATION OF SEDIMENT

**Water level in Sediment Pond (Feet):** 8.95' ON STAFF

**Clarity (Feet):** ABOUT 6 FEET. WATER IN POND IS DARK GREEN, CANNOT SEE BOTTOM.

**East Mill Creek Sediment Control Structure Site Inspection Form**
**Page *2 of 3***

| **Monitoring: Once Per Month, After Storm Events≥ 2.64" in 24 Hour Period (100-Year, 24-Hour Storm Event), and After Storm Events≥ 0.8" in a 1 Hour Period (25-Year, 1-Hour Storm Event) (May-Oct.)** | | | | |
|---|---|---|---|---|
| **Location** | **BMP** | **BMP Functionality** | **BMP Functioning Properly?** | **Corrective Action Needed/Notes** |
| EMD Sediment Pond | Graded Area Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Riprap below Culvert Outfalls | ✓ Riprap is in-place (i.e., not washed away)<br>✓ No soil washed out from under riprap<br>✓ No diversion of runoff flow around riprap resulting in additional rill erosion | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Riprap Energy Dissipater | ✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure<br>✓ Pore spaces within sediment control structure remains unblocked | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Sediment Control Structure | ✓ Depth of sediment at staff gauge in the sediment pond is less than 7.0 feet<br>✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure<br>✓ Soil is in-place (i.e., not washed away)<br>✓ No animal burrow holes or tree growth<br>✓ No washing away of the soil used to construct the sediment control structure,<br>✓ No erosion of the upper reach of East Mill Creek caused by water flowing over the spillway and down the face of the sediment control structure.<br>✓ Pore spaces within sediment control structure remains unblocked<br>✓ No erosion on the downstream side where seep occurs at the toe of the sediment control structure (note turbidity of seep water, and flow rate of seep, if possible) | ☑ Yes<br>☐ No | |

**East Mill Creek Sediment Control Structure Site Inspection Form**
**Page *3 of 3***

| **Monitoring: Once Per Month, After Storm Events≥ 2.64" in 24 Hour Period (100-Year, 24-Hour Storm Event), and After Storm Events≥ 0.8" in a 1 Hour Period (25-Year, 1-Hour Storm Event) (May-Oct.)** | | | | |
|---|---|---|---|---|
| **Location** | **BMP** | **BMP Functionality** | **BMP Functioning Properly?** | **Corrective Action Needed/Notes** |
| EMD Toe | Riprap Toe Berm | ✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure | ☑ Yes<br>☐ No | |
| EMD Rills | Erosion Controls | ✓ Logs are in-place in rills (i.e., not washed away)<br>✓ Rills are not increasing in size (i.e., no additional erosion is occurring) | ☑ Yes<br>☐ No | |
| Growth Media Borrow Area | Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |
| West Mill Dump Soil Consolidation Area | Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |

**Comments:**

THIS SITE IS STABLE AND HAS HANDLED SPRING RUNOFF WITH NO PROBLEMS. VEGETATION IS GROWING AND FLOWS HAVE STARTED TO SUBSIDE.

Note:
* Document when vegetation is at 70% permanent cover under the "Corrective Action Needed/Notes" column.

**Print Name & Title:** JAMES B. WILLIAMS - INSPECTOR **End Time:** 1530

**Signature:** J. B. Will **Date:** 06/05/12

# NORTH MAYBE MINE TCRA
# INSPECTION PHOTOS – JUNE 5, 2012


Photo taken looking north, showing the graded area surrounding the sediment pond, riprap below culvert outfalls, riprap energy dissipater, riprap toe berm, logs placed in rills on East Mill Dump and the sediment control structure.


Photo taken looking east showing the logs in the rills on East Mill Dump. No evidence of erosion is present.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – JUNE 5, 2012


Photo taken looking south, showing the riprap lined upper culvert outfall, the riprap toe berm, and the riprap energy dissipater. No evidence of erosion is present.


Photo taken looking south, showing the graded area surrounding the sediment pond, riprap below culvert outfalls, riprap energy dissipater, riprap toe berm, logs placed in rills on East Mill Dump and the sediment control structure.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – JUNE 5, 2012


Photo taken looking west, showing the lower culvert outfall and clarity of the sediment control pond. Riprap armor below lower culvert outfall is doing a good job preventing scour and erosion.


Photo taken looking north, showing the upper weir and the sediment control structure. No evidence of erosion is present.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – JUNE 5, 2012


This photo is the toe of the riprap energy dissipater. Riprap armor is holding up well.


Photo taken looking north, showing the east slope of the sediment control pond. Vegetation has established well. No signs of erosion are observed on this slope.


Photo taken looking north, from the top of the sediment control structure showing the lower weir and riprap lined channel below the sediment control structure.


Photo taken looking south, showing a close up of the lower weir and riprap lined channel below the sediment control structure. This area is in good condition with vegetation well established on side-slopes.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – JUNE 5, 2012


Photo taken looking south, showing the riprap lined channel below the sediment control structure and the lower weir.


Photo taken looking south, showing the waste consolidation area.


Photo taken looking southeast, showing the waste consolidation area. Area shows no evidence of erosion.


Photo taken looking east, showing the access road along the North Maybe Pit end wall. Some rock has rolled into the ditch but still maintains a flow line.


Photo taken looking east, showing the lower portion of the access road. Road and ditch are in good condition with no signs of erosion.


Photo taken looking west, showing the lower portion of the access road. The road and ditch are in good condition.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – JUNE 5, 2012


Photo taken looking north, showing the lower portion of the access road. The road and ditch are in good condition.


Photo taken looking west, showing the growth media borrow area located at the north end of the pit. This area is holding up well showing no signs of erosion and vegetation established.

# INSPECTION FORMS AND PHOTOS

## JULY 5, 2012

**East Mill Creek Sediment Control Structure Site Inspection Form**
**Page 1 of 3**

## General Information

**Inspector's Name:** JAMES B. WILLIAMS

**Date:** JULY 05, 2012 **Start Time:** 1030

**Monthly Surface Water Sampling Event?:** ☑ Yes ☐ No

**Type of Monitoring:** ☑ Regular (Monthly) ☐ Post-storm event

**Has there been a storm event since the last inspection?** ☑ Yes ☐ No NO RAIN EVENTS GREATER THAN 0.1"/DAY SINCE THE JUNE INSPECTION. 1 EVENT OF 0.07" ↙

If Yes - Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):

~~07/05 14:00, 3 HRS 59 MIN, 0.07" JDW~~

06/09 1:18, 2 HRS 53 MIN, 0.07"

**Weather at time of this inspection?** ☐ Clear ☑ Cloudy ☑ Rain ☐ Fog ☐ Snow ☐ Windy

Temperature: 61°F Description: COOL, OVERCAST, LIGHT RAIN, HAS BEEN HOT & DRY LAST FEW WEEKS

**Approximate staff gauge reading & flow rate at the weir located at the Toe of East Mill Dump, above the sediment control structure (IA1-55):**

0.195 Staff Gauge Reading (feet) 19 Corresponding Flow Rate (gallons per minute)

**Approximate staff gauge reading & flow rate at the weir located in East Mill Creek at toe of sediment control structure (IA1-30A):**

0.120 Staff Gauge Reading (feet) 5.7 Corresponding Flow Rate (gallons per minute)

**Has the flow increased or decreased since the last site inspection?** ☑ Yes ☐ No **If yes, describe:** DECREASED BY 13 GPM AT IA1-55, BY 11.3 GPM AT IA1-30A.

**Is any water flowing through the spillway in the Sediment Control Structure?** ☑ Yes ☐ No **If yes, describe:**

FAINTLY AUDIBLE FLOW THROUGH COARSE RIPRAP AT THE SPILLWAY.

## Surface Water Sampling: Monthly (May-Oct.)

Note, if samples are collected attach a copy of the completed "Field Water Quality Sampling Form" to this Inspection Form for each sample location. These forms can be found in the 2009 Groundwater and Surface Water Sampling Work Plan for North Maybe Mine.

| | Toe of East Mill Dump Cross Valley Fill (IA1-55) | Sediment Pond (IA1-28A) | East Mill Creek (IA1-30A) |
|---|---|---|---|
| Sample Collected? | ☑ Yes ☐ No | ☑ Yes ☐ No | ☑ Yes ☐ No |

**Depth of Sediment at Staff Gauge in Sediment Pond (Feet):** NO ACCUMULATION OF SEDIMENT.

**Water level in Sediment Pond (Feet):** 8.9 ON STAFF

**Clarity (Feet):** 2-3 FEET. WATER IN POND HAS BECOME DARK GREEN WITH FLOATING MOSS. CANNOT SEE THE BOTTOM.

**East Mill Creek Sediment Control Structure Site Inspection Form**
**Page *2 of 3***

| **Monitoring: Once Per Month, After Storm Events ≥ 2.64" in 24 Hour Period (100-Year, 24-Hour Storm Event), and After Storm Events ≥ 0.8" in a 1 Hour Period (25-Year, 1-Hour Storm Event) (May-Oct.)** | | | | |
|---|---|---|---|---|
| **Location** | **BMP** | **BMP Functionality** | **BMP Functioning Properly?** | **Corrective Action Needed/Notes** |
| EMD Sediment Pond | Graded Area Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Riprap below Culvert Outfalls | ✓ Riprap is in-place (i.e., not washed away)<br>✓ No soil washed out from under riprap<br>✓ No diversion of runoff flow around riprap resulting in additional rill erosion | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Riprap Energy Dissipater | ✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure<br>✓ Pore spaces within sediment control structure remains unblocked | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Sediment Control Structure | ✓ Depth of sediment at staff gauge in the sediment pond is less than 7.0 feet<br>✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure<br>✓ Soil is in-place (i.e., not washed away)<br>✓ No animal burrow holes or tree growth<br>✓ No washing away of the soil used to construct the sediment control structure,<br>✓ No erosion of the upper reach of East Mill Creek caused by water flowing over the spillway and down the face of the sediment control structure.<br>✓ Pore spaces within sediment control structure remains unblocked<br>✓ No erosion on the downstream side where seep occurs at the toe of the sediment control structure (note turbidity of seep water, and flow rate of seep, if possible) | ☑ Yes<br>☐ No | |

**East Mill Creek Sediment Control Structure Site Inspection Form**
**Page *3 of 3***

| **Monitoring: Once Per Month, After Storm Events ≥ 2.64" in 24 Hour Period (100-Year, 24-Hour Storm Event), and After Storm Events ≥ 0.8" in a 1 Hour Period (25-Year, 1-Hour Storm Event) (May-Oct.)** | | | | |
|---|---|---|---|---|
| **Location** | **BMP** | **BMP Functionality** | **BMP Functioning Properly?** | **Corrective Action Needed/Notes** |
| EMD Toe | Riprap Toe Berm | ✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure | ☑ Yes<br>☐ No | |
| EMD Rills | Erosion Controls | ✓ Logs are in-place in rills (i.e., not washed away)<br>✓ Rills are not increasing in size (i.e., no additional erosion is occurring) | ☑ Yes<br>☐ No | |
| Growth Media Borrow Area | Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |
| West Mill Dump Soil Consolidation Area | Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |

**Comments:**
SITE IS STABLE AND FUNCTIONING AS DESIGNED.

Note:
* Document when vegetation is at 70% permanent cover under the "Corrective Action Needed/Notes" column.

**Print Name & Title:** JAMES B. WILLIAMS **End Time:** 1200

**Signature:** James B. Williams **Date:** 07/05/12

# NORTH MAYBE MINE TCRA
# INSPECTION PHOTOS – JULY 5, 2012


Photo taken looking north, showing the graded area surrounding the sediment pond, riprap below culvert outfalls, riprap energy dissipater, riprap toe berm, logs placed in rills on East Mill Dump and the sediment control structure. No evidence of erosion was observed in these areas and the vegetation is abundant.


Photo taken looking southeast showing the logs in the rills on East Mill Dump and the riprap lined channel below the upper culvert. No evidence of erosion is present.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – JULY 5, 2012


Photo taken looking south, showing the graded area surrounding the sediment pond, riprap below culvert outfalls, riprap energy dissipater, riprap toe berm, logs placed in rills on East Mill Dump and the sediment control structure. The area is in good condition with abundant vegetation.


Photo taken looking east, showing the riprap lined channel below the lower culvert and the clarity of the sediment control pond.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – JULY 5, 2012


Photo taken looking north, showing the upper weir and the sediment control structure. No evidence of erosion is present and vegetation is well established along the channel.


This photo is the toe of the riprap energy dissipater. Riprap armor is holding up well.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – JULY 5, 2012


Photo taken looking south, showing the riprap lined channel below the upper culvert outfall. No sign of erosion is present.


Photo taken looking south, showing the east side (west facing) slope of the graded area above the sediment control pond. Vegetation is well established on this slope with no signs of erosion occurring.


Photo taken looking west, showing the lower culvert outfall and clarity of the sediment control pond. Riprap armor below lower culvert outfall is doing a good job preventing scour and erosion.


Photo taken looking north, from the top of the sediment control structure showing the lower weir and riprap lined channel below the sediment control structure. The vegetation is very abundant and the area is in good condition.


Photo taken looking north, showing the lower weir and riprap lined channel below the sediment control structure. This area is in good condition with vigorous vegetation established on side-slopes.


Photo taken looking north, showing the riprap lined channel below the lower weir. This area is well vegetated and stable.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – JULY 5, 2012


Photo taken looking south, showing the riprap lined channel below the sediment control structure and the lower weir.


Photo taken looking south, showing the waste consolidation area. Vegetation has established and there is no sign of erosion.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – JULY 5, 2012


Photo taken looking southeast, showing the waste consolidation area. Area shows no evidence of erosion with abundant vegetation.


Photo taken looking west, showing the growth media borrow area located at the north end of the pit. This area is holding up well showing no signs of erosion and vegetation becoming established.

**INSPECTION FORMS AND PHOTOS**

**AUGUST 6, 2012**

**East Mill Creek Sediment Control Structure Site Inspection Form**
**Page *1* of *3***

## General Information

**Inspector's Name:** JAMES B. WILLIAMS

**Date:** AUGUST 06, 2012 **Start Time:** 1100

**Monthly Surface Water Sampling Event?:** ☑ Yes ☐ No

**Type of Monitoring:** ☑ Regular (Monthly) ☐ Post-storm event

**Has there been a storm event since the last inspection?** ☑ Yes ☐ No RAIN EVENTS GREATER THAN 0.10 IN/DAY NOTED:

If Yes - Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):

07/05 13:08, 4 HRS 51 MIN., 0.29"
07/07 14:02, 2 HRS 58 MIN., 0.68"
07/14 14:29, 8 HRS 26 MIN., 0.11"

**Weather at time of this inspection?** ☑ Clear ☑ Cloudy ☐ Rain ☐ Fog ☐ Snow ☐ Windy

Temperature: 74° F Description: HOT, DRY, PARTLY CLOUDY

**Approximate staff gauge reading & flow rate at the weir located at the Toe of East Mill Dump, above the sediment control structure (IA1-55):**

0.180 Staff Gauge Reading (feet) 16.0 Corresponding Flow Rate (gallons per minute)

**Approximate staff gauge reading & flow rate at the weir located in East Mill Creek at toe of sediment control structure (IA1-30A):**

0.100 Staff Gauge Reading (feet) 3.6 Corresponding Flow Rate (gallons per minute)

**Has the flow increased or decreased since the last site inspection?** ☑ Yes ☐ No **If yes, describe:**

DECREASED BY 3.0 GPM AT IA1-55, BY 2.1 GPM AT IA1-30A

**Is any water flowing through the spillway in the Sediment Control Structure?** ☑ Yes ☐ No **If yes, describe:**

FAINTLY AUDIBLE FLOW THROUGH COARSE RIPRAP AT THE SPILLWAY

## Surface Water Sampling: Monthly (May-Oct.)

Note, if samples are collected attach a copy of the completed "Field Water Quality Sampling Form" to this Inspection Form for each sample location. These forms can be found in the 2009 Groundwater and Surface Water Sampling Work Plan for North Maybe Mine.

| | Toe of East Mill Dump Cross Valley Fill (IA1-55) | Sediment Pond (IA1-28A) | East Mill Creek (IA1-30A) |
|---|---|---|---|
| Sample Collected? | ☑ Yes ☐ No | ☑ Yes ☐ No | ☑ Yes ☐ No |

**Depth of Sediment at Staff Gauge in Sediment Pond (Feet):** NO ACCUMULATION OF SEDIMENT.

**Water level in Sediment Pond (Feet):** 8.9 ON STAFF

**Clarity (Feet):** 2 FEET. WATER IS GREEN WITH FLOATING AND SUSPENDED ORGANICS.

**East Mill Creek Sediment Control Structure Site Inspection Form**


| **Monitoring: Once Per Month, After Storm Events ≥ 2.64" in 24 Hour Period (100-Year, 24-Hour Storm Event), and After Storm Events ≥ 0.8" in a 1 Hour Period (25-Year, 1-Hour Storm Event) (May-Oct.)** | | | | |
|---|---|---|---|---|
| **Location** | **BMP** | **BMP Functionality** | **BMP Functioning Properly?** | **Corrective Action Needed/Notes** |
| EMD Sediment Pond | Graded Area Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Riprap below Culvert Outfalls | ✓ Riprap is in-place (i.e., not washed away)<br>✓ No soil washed out from under riprap<br>✓ No diversion of runoff flow around riprap resulting in additional rill erosion | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Riprap Energy Dissipater | ✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure<br>✓ Pore spaces within sediment control structure remains unblocked | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Sediment Control Structure | ✓ Depth of sediment at staff gauge in the sediment pond is less than 7.0 feet<br>✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure<br>✓ Soil is in-place (i.e., not washed away)<br>✓ No animal burrow holes or tree growth<br>✓ No washing away of the soil used to construct the sediment control structure,<br>✓ No erosion of the upper reach of East Mill Creek caused by water flowing over the spillway and down the face of the sediment control structure.<br>✓ Pore spaces within sediment control structure remains unblocked<br>✓ No erosion on the downstream side where seep occurs at the toe of the sediment control structure (note turbidity of seep water, and flow rate of seep, if possible) | ☑ Yes<br>☐ No | |

**East Mill Creek Sediment Control Structure Site Inspection Form**
**Page *3 of 3***

| Monitoring: Once Per Month, After Storm Events ≥ 2.64" in 24 Hour Period (100-Year, 24-Hour Storm Event), and After Storm Events ≥ 0.8" in a 1 Hour Period (25-Year, 1-Hour Storm Event) (May-Oct.) | | | | |
|---|---|---|---|---|
| **Location** | **BMP** | **BMP Functionality** | **BMP Functioning Properly?** | **Corrective Action Needed/Notes** |
| EMD Toe | Riprap Toe Berm | ✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure | ☑ Yes<br>☐ No | |
| EMD Rills | Erosion Controls | ✓ Logs are in-place in rills (i.e., not washed away)<br>✓ Rills are not increasing in size (i.e., no additional erosion is occurring) | ☑ Yes<br>☐ No | STORMWATER CREATED SOME EROSION IN RILLS ABOVE THE ACCESS ROAD BUT NOT BELOW THE ROAD AT THE TCRA. |
| Growth Media Borrow Area | Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |
| West Mill Dump Soil Consolidation Area | Revegetation Efforts* | ✓ No rill development | ☐ Yes<br>☑ No | STORMWATER SHEET FLOW FROM THIS AREA CONCENTRATED AND CREATED A RILL WHERE IT FLOW DOWN INTO THE HAULROAD DITCH. |

**Comments:**

THE STORM EVENT OF JULY 7 FILLED A NUMBER OF THE ROADSIDE SEDIMENT TRAPS ALONG THE ACCESS ROAD ABOVE THE TCRA. RECOMMEND CLEANING OUT THE ROADSIDE SEDIMENT TRAPS AND REPAIRING ANY DAMAGE TO THE DITCH. THE TCRA AREA WAS NOT ADVERSLY AFFECTED BY THE STORM.

Note:
* Document when vegetation is at 70% permanent cover under the "Corrective Action Needed/Notes" column.

**Print Name & Title:** JAMES B. WILLIAMS **End Time:** 1300

**Signature:** James B. Williams **Date:** 08/06/12

# NORTH MAYBE MINE TCRA
# INSPECTION PHOTOS – AUGUST 6, 2012


Photo taken looking north, showing the graded area surrounding the sediment pond, riprap below culvert outfalls, riprap energy dissipater, riprap toe berm, logs placed in rills on East Mill Dump and the sediment control structure. No evidence of erosion was observed in these areas and the vegetation is abundant.


Photo taken looking south, showing the graded area surrounding the sediment pond, riprap below culvert outfalls, riprap energy dissipater, riprap toe berm, logs placed in rills on East Mill Dump and the sediment control structure.


Photo taken looking east, showing the lower culvert outfall and the clarity of the sediment control pond.


Photo taken looking east, showing the vegetation cover on the east slope of the graded area above the sediment control pond.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – AUGUST 6, 2012


Photo taken looking north, showing the upper weir and the sediment control pond and structure. This photo shows great vegetation establishment and that the channel is in good condition.


This photo is the toe of the riprap energy dissipater. Riprap armor is holding up well.


Photo taken looking south, showing the riprap lined channel below the upper culvert outfall. No sign of erosion is present.


Photo taken looking southeast showing the logs in the rills on East Mill Dump and the riprap lined channel below the upper culvert outfall. No evidence of erosion is present.


Photo taken looking north, from the top of the sediment control structure showing the lower weir and riprap lined channel below the sediment control structure.


Photo taken looking south, showing a close up of the lower weir and riprap lined channel below the sediment control structure. This area is in good condition with vigorous vegetation established on side-slopes.


Photo taken looking south, showing the riprap lined channel below the sediment control structure and the lower weir.


Photo taken looking north, showing the riprap lined channel below lower weir. This area is stable with a good establishment of vegetation.


Photo taken looking south, showing the waste consolidation area. Vegetation has established.


Photo taken looking southeast, showing the waste consolidation area.


Photo taken looking west, showing the growth media borrow area located at the north end of the pit. This area is holding up well showing no signs of erosion and vegetation becoming established.


Photo taken looking south, showing an erosion rill that formed from water running off the area below the waste consolidation area.


Photo taken looking west, showing the upper portion of the access road. Ditch experienced some erosion and scouring from a recent storm event.


Photo taken looking east, showing the upper portion of the access road. Ditch experienced some erosion and scouring from a recent storm event.


Photo taken looking east, showing the middle portion of the access road – along the north end of the North Maybe Pit. Ditch experienced some erosion and scouring from a recent storm event.


Photo taken looking east, showing the lower portion of the access road. Ditch experienced some erosion and scouring from a recent storm event.


Photo taken looking west, showing the lower portion of the access road. Ditch experienced some minor erosion and scouring from a recent storm event.


Photo taken looking west, showing the lower portion of the access road. Road and ditch are in good condition with no signs of erosion.

**INSPECTION FORMS AND PHOTOS**

**SEPTEMBER 4, 2012**

**East Mill Creek Sediment Control Structure Site Inspection Form**


## General Information

**Inspector's Name:** JAMES B. WILLIAMS

**Date:** SEPTEMBER 04, 2012 **Start Time:** 1030

**Monthly Surface Water Sampling Event?:** ☑ Yes ☐ No

**Type of Monitoring:** ☑ Regular (Monthly) ☐ Post-storm event

**Has there been a storm event since the last inspection?** ☑ Yes ☐ No ONE STORM OVER 0.10"

If Yes - Storm Start Date & Time: 09/01/12, 12:00AM Storm Duration (hrs): 2 HRS 47 MIN Approximate Amount of Precipitation (in): 0.17"

**Weather at time of this inspection?** ☑ Clear ☐ Cloudy ☐ Rain ☐ Fog ☐ Snow ☐ Windy

Temperature: 61° F Description: WARM, DRY, CLEAR, BREEZY DAY

**Approximate staff gauge reading & flow rate at the weir located at the Toe of East Mill Dump, above the sediment control structure (IA1-55):**

0.170 Staff Gauge Reading (feet) 14 Corresponding Flow Rate (gallons per minute)

**Approximate staff gauge reading & flow rate at the weir located in East Mill Creek at toe of sediment control structure (IA1-30A):**

0.080' Staff Gauge Reading (feet) 2.1 Corresponding Flow Rate (gallons per minute)

**Has the flow increased or decreased since the last site inspection?** ☑ Yes ☐ No **If yes, describe:**

DECREASED BY 2 GPM AT IA1-55, BY 1.5 GPM AT IA1-30A

**Is any water flowing through the spillway in the Sediment Control Structure?** ☐ Yes ☑ No **If yes, describe:**

## Surface Water Sampling: Monthly (May-Oct.)

Note, if samples are collected attach a copy of the completed "Field Water Quality Sampling Form" to this Inspection Form for each sample location. These forms can be found in the 2009 Groundwater and Surface Water Sampling Work Plan for North Maybe Mine.

| | Toe of East Mill Dump Cross Valley Fill (IA1-55) | Sediment Pond (IA1-28A) | East Mill Creek (IA1-30A) |
|---|---|---|---|
| Sample Collected? | ☑ Yes ☐ No | ☑ Yes ☐ No | ☑ Yes ☐ No |

**Depth of Sediment at Staff Gauge in Sediment Pond (Feet):** NO APPARENT ACCUMULATION OF SEDIMENT.

**Water level in Sediment Pond (Feet):** 8.75 ON STAFF (DIFFICULT TO READ DUE TO ALGAE ON STAFF)

**Clarity (Feet):** ABOUT 2 FEET - WATER HAS A GREEN HUE.

| **Monitoring: Once Per Month, After Storm Events≥ 2.64" in 24 Hour Period (100-Year, 24-Hour Storm Event), and After Storm Events≥ 0.8" in a 1 Hour Period (25-Year, 1-Hour Storm Event) (May-Oct.)** | | | | |
|---|---|---|---|---|
| **Location** | **BMP** | **BMP Functionality** | **BMP Functioning Properly?** | **Corrective Action Needed/Notes** |
| EMD Sediment Pond | Graded Area Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Riprap below Culvert Outfalls | ✓ Riprap is in-place (i.e., not washed away)<br>✓ No soil washed out from under riprap<br>✓ No diversion of runoff flow around riprap resulting in additional rill erosion | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Riprap Energy Dissipater | ✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure<br>✓ Pore spaces within sediment control structure remains unblocked | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Sediment Control Structure | ✓ Depth of sediment at staff gauge in the sediment pond is less than 7.0 feet<br>✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure<br>✓ Soil is in-place (i.e., not washed away)<br>✓ No animal burrow holes or tree growth<br>✓ No washing away of the soil used to construct the sediment control structure,<br>✓ No erosion of the upper reach of East Mill Creek caused by water flowing over the spillway and down the face of the sediment control structure.<br>✓ Pore spaces within sediment control structure remains unblocked<br>✓ No erosion on the downstream side where seep occurs at the toe of the sediment control structure (note turbidity of seep water, and flow rate of seep, if possible) | ☑ Yes<br>☐ No | |

**East Mill Creek Sediment Control Structure Site Inspection Form**
**Page *3 of 3***

| Monitoring: Once Per Month, After Storm Events≥ 2.64" in 24 Hour Period (100-Year, 24-Hour Storm Event), and After Storm Events≥ 0.8" in a 1 Hour Period (25-Year, 1-Hour Storm Event) (May-Oct.) | | | | |
|---|---|---|---|---|
| **Location** | **BMP** | **BMP Functionality** | **BMP Functioning Properly?** | **Corrective Action Needed/Notes** |
| EMD Toe | Riprap Toe Berm | ✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure | ☑ Yes<br>☐ No | |
| EMD Rills | Erosion Controls | ✓ Logs are in-place in rills (i.e., not washed away)<br>✓ Rills are not increasing in size (i.e., no additional erosion is occurring) | ☑ Yes<br>☐ No | |
| Growth Media Borrow Area | Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |
| West Mill Dump Soil Consolidation Area | Revegetation Efforts* | ✓ No rill development | ☐ Yes<br>☑ No | ITEM DESCRIBED IN PREVIOUS (AUGUST) INSPECTION REMAINS IN THE SAME CONDITION. NO GO-AHEAD APPROVAL FROM NU-WEST TO CONDUCT THIS MAINTENANCE AT THIS TIME. |

**Comments:**

AS NOTED IN AUGUST INSPECTION, ROADSIDE SEDIMENT TRAPS NEED CLEANED OUT. NO APPROVAL AT THIS TIME.
ALSO NOTE: THE NORTH DRY RIDGE CORE DRILLING PROGRAM (MINE PERMITTING TEAM) HAS ESTABLISHED A LAY-DOWN YARD & WATER STORAGE AREA AT THE FLAT SPOT AT THE TOE OF THE WEST MILL DUMP SOIL CONSOLIDATION AREA.

Note:
* Document when vegetation is at 70% permanent cover under the "Corrective Action Needed/Notes" column.

**Print Name & Title:** JAMES B. WILLIAMS **End Time:** 1215

**Signature:** James B. Williams **Date:** 09/04/12

# NORTH MAYBE MINE TCRA
# INSPECTION PHOTOS – SEPTEMBER 4, 2012


Photo taken looking north, showing the graded area surrounding the sediment pond, riprap below culvert outfalls, riprap energy dissipater, riprap toe berm, logs placed in rills on East Mill Dump and the sediment control structure.


Photo taken looking south, showing the graded area surrounding the sediment pond, riprap below culvert outfalls, riprap energy dissipater, riprap toe berm, logs placed in rills on East Mill Dump and the sediment control structure.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – SEPTEMBER 4, 2012


Photo taken looking north, showing the upper weir and the sediment control pond and structure. This photo shows the vegetation is well established and that the channel is in good condition.


This photo is the toe of the riprap energy dissipater. Riprap armor is holding up well and there is abundant vegetation.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – SEPTEMBER 4, 2012


Photo taken looking south, showing the riprap lined channel below the upper culvert outfall. No sign of erosion is present.


Photo taken looking east, showing the lower culvert outfall riprap lined channel and the clarity of the sediment pond.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – SEPTEMBER 4, 2012


Photo taken looking southeast showing the logs in the rills on East Mill Dump and the riprap lined channel below the upper culvert outfall. No evidence of erosion is present.


Photo taken looking north, from the top of the sediment control structure showing the lower weir and riprap lined channel below the sediment control structure.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – SEPTEMBER 4, 2012


Photo taken looking south, showing the riprap lined channel below the sediment control structure and the lower weir. Abundant vegetation has established and this area is in good condition.


Photo taken looking south, showing the riprap lined channel below the sediment control structure and a close-up of the lower weir. Abundant vegetation has established and this area is in good condition.


Photo taken looking south, showing the waste consolidation area. The area at the toe of the waste consolidation area is being utilized by the North Dry Ridge exploration drilling crews.


Photo taken looking southeast, showing the waste consolidation area. The area at the toe of the waste consolidation area is being utilized by the North Dry Ridge exploration drilling crews.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – SEPTEMBER 4, 2012

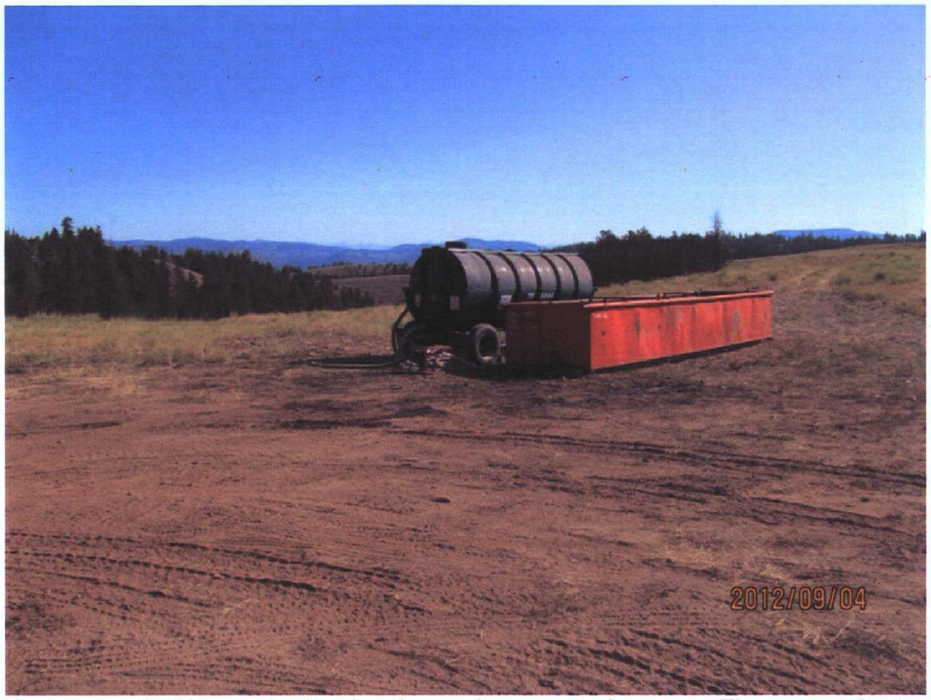



Photo taken looking east, showing the equipment staging area. The area at the toe of the waste consolidation area is being utilized by the North Dry Ridge exploration drilling crews.


Photo taken looking west, showing the growth media borrow area located at the north end of the pit. This area is holding up well showing no signs of erosion and vegetation becoming established.

INSPECTION FORMS AND PHOTOS

OCTOBER 1, 2012

**East Mill Creek Sediment Control Structure Site Inspection Form**
**Page *1 of 3***

## General Information

**Inspector's Name:** JAMES B. WILLIAMS

**Date:** OCTOBER 01, 2012 **Start Time:** 1215

**Monthly Surface Water Sampling Event?:** ☑ Yes ☐ No

**Type of Monitoring:** ☑ Regular (Monthly) ☐ Post-storm event

**Has there been a storm event since the last inspection?** ☑ Yes ☐ No ONE STORM OVER 0.10"

If Yes - Storm Start Date & Time: 09/24/12, 03:03, Storm Duration (hrs): 13 HRS 49 MIN, Approximate Amount of Precipitation (in): 0.10"

**Weather at time of this inspection?** ☑ Clear ☐ Cloudy ☐ Rain ☐ Fog ☐ Snow ☐ Windy

Temperature: 61° F Description: CLEAR, SUNNY, WARM, SLIGHT MOUNTAIN BREEZE.

**Approximate staff gauge reading & flow rate at the weir located at the Toe of East Mill Dump, above the sediment control structure (IA1-55):**

0.175 Staff Gauge Reading (feet) 15 Corresponding Flow Rate (gallons per minute)

**Approximate staff gauge reading & flow rate at the weir located in East Mill Creek at toe of sediment control structure (IA1-30A):**

0.075 Staff Gauge Reading (feet) 1.8 Corresponding Flow Rate (gallons per minute)

**Has the flow increased or decreased since the last site inspection?** ☑ Yes ☐ No **If yes, describe:**

INCREASED BY 1 GPM AT IA1-55, DECREASED BY ~~0.03~~ 0.3 GPM AT IA1-30A

**Is any water flowing through the spillway in the Sediment Control Structure?** ☐ Yes ☑ No **If yes, describe:**

## Surface Water Sampling: Monthly (May-Oct.)

Note, if samples are collected attach a copy of the completed "Field Water Quality Sampling Form" to this Inspection Form for each sample location. These forms can be found in the 2009 Groundwater and Surface Water Sampling Work Plan for North Maybe Mine.

| | Toe of East Mill Dump Cross Valley Fill (IA1-55) | Sediment Pond (IA1-28A) | East Mill Creek (IA1-30A) |
|---|---|---|---|
| Sample Collected? | ☑ Yes ☐ No | ☑ Yes ☐ No | ☑ Yes ☐ No |

**Depth of Sediment at Staff Gauge in Sediment Pond (Feet):** NO APPARENT ACCUMULATION OF SEDIMENT.

**Water level in Sediment Pond (Feet):** 8.7 FT ON STAFF (DIFFICULT TO READ DUE TO ALGAE ON STAFF)

**Clarity (Feet):** ABOUT 1.5 FT. WATER HAS A BRIGHT GREEN ORGANIC HUE.

**East Mill Creek Sediment Control Structure Site Inspection Form**
**Page *2 of 3***

| **Monitoring: Once Per Month, After Storm Events≥ 2.64" in 24 Hour Period (100-Year, 24-Hour Storm Event), and After Storm Events≥ 0.8" in a 1 Hour Period (25-Year, 1-Hour Storm Event) (May-Oct.)** | | | | |
|---|---|---|---|---|
| **Location** | **BMP** | **BMP Functionality** | **BMP Functioning Properly?** | **Corrective Action Needed/Notes** |
| EMD Sediment Pond | Graded Area Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Riprap below Culvert Outfalls | ✓ Riprap is in-place (i.e., not washed away)<br>✓ No soil washed out from under riprap<br>✓ No diversion of runoff flow around riprap resulting in additional rill erosion | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Riprap Energy Dissipater | ✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure<br>✓ Pore spaces within sediment control structure remains unblocked | ☑ Yes<br>☐ No | |
| EMD Sediment Pond | Sediment Control Structure | ✓ Depth of sediment at staff gauge in the sediment pond is less than 7.0 feet<br>✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure<br>✓ Soil is in-place (i.e., not washed away)<br>✓ No animal burrow holes or tree growth<br>✓ No washing away of the soil used to construct the sediment control structure,<br>✓ No erosion of the upper reach of East Mill Creek caused by water flowing over the spillway and down the face of the sediment control structure.<br>✓ Pore spaces within sediment control structure remains unblocked<br>✓ No erosion on the downstream side where seep occurs at the toe of the sediment control structure (note turbidity of seep water, and flow rate of seep, if possible) | ☑ Yes<br>☐ No | PULLED A SMALL WOODY PLANT GROWING UP THROUGH RIPRAP OF SED CONTROL STRUCTURE. |

**East Mill Creek Sediment Control Structure Site Inspection Form**
**Page *3 of 3***

| **Monitoring: Once Per Month, After Storm Events≥ 2.64" in 24 Hour Period (100-Year, 24-Hour Storm Event), and After Storm Events≥ 0.8" in a 1 Hour Period (25-Year, 1-Hour Storm Event) (May-Oct.)** | | | | |
|---|---|---|---|---|
| **Location** | **BMP** | **BMP Functionality** | **BMP Functioning Properly?** | **Corrective Action Needed/Notes** |
| EMD Toe | Riprap Toe Berm | ✓ Riprap is in-place (i.e., not washed away)<br>✓ Type II geotextile is not being undercut beneath the sediment control structure | ☑ Yes<br>☐ No | |
| EMD Rills | Erosion Controls | ✓ Logs are in-place in rills (i.e., not washed away)<br>✓ Rills are not increasing in size (i.e., no additional erosion is occurring) | ☑ Yes<br>☐ No | |
| Growth Media Borrow Area | Revegetation Efforts* | ✓ No rill development | ☑ Yes<br>☐ No | |
| West Mill Dump Soil Consolidation Area | Revegetation Efforts* | ✓ No rill development | ☐ Yes<br>☑ No | ITEM DESCRIBED IN PREVIOUS (AUGUST) INSPECTION REMAINS IN THE SAME CONDITION. NO FORMAL GO-AHEAD APPROVAL TO CONDUCT THIS MAINTENANCE AT THIS TIME. |

**Comments:**

AS PREVIOUSLY NOTED (AUG & SEPT INSPECTIONS), NO FORMAL APPROVAL RECIEVED TO CLEAN OUT THE ROAD SIDE SEDIMENT TRAPS AT THIS TIME.

ALSO NOTE: THE NORTH DRY RIDGE (NDR) MINE PERMITTING CONTRACTORS (DRILLERS) ARE UTILIZING THE WEST MILL DUMP SOIL CONSOLODATION AREA AS AN EQUIPMENT LAY-DOWN AND PARKING AREA.

Note:
* Document when vegetation is at 70% permanent cover under the "Corrective Action Needed/Notes" column.

**Print Name & Title:** JAMES B. WILLIAMS - INSPECTOR **End Time:** 1415

**Signature:** James B. Williams **Date:** 10/01/12

# NORTH MAYBE MINE TCRA
# INSPECTION PHOTOS – OCTOBER 1, 2012


Photo taken looking north, showing the graded area surrounding the sediment pond, riprap below culvert outfalls, riprap energy dissipater, riprap toe berm, logs placed in rills on East Mill Dump and the sediment control structure.


Photo taken looking south, showing the graded area surrounding the sediment pond, riprap below culvert outfalls, riprap energy dissipater, riprap toe berm, logs placed in rills on East Mill Dump and the sediment control structure.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – OCTOBER 1, 2012


Photo taken looking north, showing the upper weir and the sediment control pond and structure. This photo shows vegetation establishment and that the channel is in good condition.


This photo is the toe of the riprap energy dissipater. Riprap armor is holding up well.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – OCTOBER 1, 2012


Photo taken looking southeast, showing the riprap lined channel below the upper culvert outfall and logs in Rills on East Mill Dump. No sign of erosion is present.


Photo taken looking east, showing the lower culvert riprap lined outfall and clarity of the sediment control pond.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – OCTOBER 1, 2012


Photo taken looking north, from the top of the sediment control structure showing the lower weir and riprap lined channel below the sediment control structure.


Photo taken looking north, showing a close up of the lower weir and riprap lined channel below the sediment control structure. This area is in good condition with vigorous vegetation established on side-slopes.


Photo taken looking south, showing the riprap lined channel below the sediment control structure and the lower weir.


Photo taken looking south, showing the waste consolidation area. The area at the toe of the waste consolidation area is being utilized by the North Dry Ridge exploration drilling crews.

NORTH MAYBE MINE TCRA
INSPECTION PHOTOS – OCTOBER 1, 2012


Photo taken looking southeast, showing the waste consolidation area. The area at the toe of the waste consolidation area is being utilized by the North Dry Ridge exploration drilling crews.


Photo taken looking west, showing the growth media borrow area located at the north end of the pit. This area is holding up well showing no signs of erosion and vegetation becoming established.

# APPENDIX B
# CORRECTIVE ACTION LOGS AND PHOTOS

## Corrective Action Log for the Restored North Maybe Mine East Mill Creek Sediment Control Structure

| Inspection Date | Inspector Name(s) | Description of BMP Deficiency | Corrective Action Needed (including planned date/responsible person) | Date Action Taken/ Responsible person |
|---|---|---|---|---|
| 08/06/12 | JAMES B. WILLIAMS | STORMWATER FROM A RAIN EVENT CAUSED AN EROSION RILL TO FORM ON THE | NEED TO ROCK ARMOR THE EROSION RILL THAT FORMED ON THE ACCESS ROAD CUT. | 10/22/12 — 10/29/12 VAUGHN SMITH CONSTRUCTION |
| | | HAULROAD CUT BELOW THE WEST MILL DUMP. WASTE CONSOLIDATION AREA. | NEED TO BOLSTER THE ROCK ARMOR RIP RAP ALONG THE DITCH OF THE ACCESS ROAD. | |
| | | THE WATER SUBSEQUENTLY CAUSED SCOURING ALONG THE ACCESS ROAD DITCH | NEED TO CLEAN OUT ALL THE SEDIMENT TRAPS ALONG THE ACCESS ROAD DITCH TO | |
| | | AND FILLED OR PARTIALLY FILLED THE SEDIMENT TRAPS WITHIN THE DITCH. | RESTORE SEDIMENT CAPACITY. | |
| | | THE STORM WATER DIVERTED INTO THE NORTH MAYBE PIT AS DESIGNED. STORMWATER | | |
| | | EFFECTS BELOW THE PIT WERE MUCH LESS. | | |
| | | | HAND SEEDED & FERTILIZED ALL AREAS OF DISTURBANCE WITH REGARD TO CORRECTIVE ACTIONS | 11/2/12 JAMES B. WILLIAMS |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# NORTH MAYBE MINE TCRA
# CORRECTIVE ACTION LOG PHOTOS FROM 2012


Photo taken looking south, showing an erosion rill that formed from water running off the area below the waste consolidation area.


Photo taken looking south, showing the repaired erosion rill that formed from water running off the area below the waste consolidation area.

NORTH MAYBE MINE TCRA
CORRECTIVE ACTION LOG PHOTOS FROM 2012


Photo taken looking east, showing the upper portion of the access road. Ditch experienced some erosion and scouring from a recent storm event.


Photo taken looking east, showing the upper portion of the access road. Ditch was repaired by adding riprap armor and cleaning out the sediment traps.

NORTH MAYBE MINE TCRA
CORRECTIVE ACTION LOG PHOTOS FROM 2012


Photo taken looking west, showing the upper portion of the access road. Ditch experienced some erosion and scouring from a recent storm event.


Photo taken looking west, showing the upper portion of the access road. Ditch was repaired by adding riprap armor and cleaning out the sediment traps.

NORTH MAYBE MINE TCRA
CORRECTIVE ACTION LOG PHOTOS FROM 2012


Photo taken looking east, showing the upper portion of the access road. Ditch experienced some erosion and scouring from a recent storm event.


Photo taken looking east, showing the upper portion of the access road. Ditch was repaired by adding riprap armor and cleaning out the sediment traps.

NORTH MAYBE MINE TCRA
CORRECTIVE ACTION LOG PHOTOS FROM 2012


Photo taken looking east, showing the upper portion of the access road. Ditch experienced some erosion and scouring from a recent storm event.


Photo taken looking east, showing the upper portion of the access road. Ditch was repaired by adding riprap armor and cleaning out the sediment traps.

NORTH MAYBE MINE TCRA
CORRECTIVE ACTION LOG PHOTOS FROM 2012


Photo showing an access road culvert partially filled with sediment from a recent storm event.


Photo showing the same culvert cleaned out with a rock armored flow line established.


Photo taken looking east, showing the middle portion of the access road along the North Maybe Pit endwall. Ditch experienced some erosion and scouring from a recent storm event.


Photo taken looking east, showing the middle portion of the access road along the North Maybe Pit endwall. Ditch was repaired by cutting and cleaning out the flow line.

NORTH MAYBE MINE TCRA
CORRECTIVE ACTION LOG PHOTOS FROM 2012


Photo taken looking east, showing the lower portion of the access road. Ditch experienced some erosion and scouring from a recent storm event.


Photo taken looking east, showing the lower portion of the access road. Ditch was repaired by adding riprap armor and cleaning out the sediment traps.

NORTH MAYBE MINE TCRA
CORRECTIVE ACTION LOG PHOTOS FROM 2012


Photo taken looking east. Interceptor ditch on north face of East Mill Dump was cleaned and regraded to divert stormwater flow into the pit (no before photo).


Photo taken looking west. Interceptor ditch on north face of East Mill Dump was cleaned and regraded to divert stormwater flow into the pit (no before photo).

# APPENDIX C
# FIELD FORMS

**FIELD FORMS**

**MAY 2, 2012**

## FIELD WATER QUALITY SAMPLING FORM

| Project: | North Maybe Mine TCRA | Personnel: JB Brown (J Williams) J Skinner M Hart | |
|---|---|---|---|
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 05/02/12 | 1300 |
| Temperature | YSI 556 | / | / |
| Turbidity | Hach 2100 | | |

**GENERAL**

| | | |
|---|---|---|
| Date: MAY 02, 2012 | Location: IA 1-30 A | Circle: (SW) GW |
| Time: 1405 | Lat. | Long. |

**SAMPLING CONDITIONS**

| | |
|---|---|
| Sampling Method: GRAB | Depth Sample Taken: SW |
| Water Level BTC (ft): | Well Depth BTC (ft): |

Water Appearance: CLEAR - NO ODOR

Stream Flow: STAFF = 0.37' = 95 GPM

**FIELD MEASUREMENTS**

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 8.12 | 396 | ~~5.94~~ Jaw | ~~277.6~~ | 78.7 | 9.30 | 1.25 |
| | | 7.94 | 170.5 | | | |
| | | | | | | |

**SAMPLES COLLECTED**

| | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) / (Filtered) |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature: John B. Williams Date: 05/02/12

BLIND DUP HERE:
DUP-050212-A
@ 1330

## FIELD WATER QUALITY SAMPLING FORM

| | | | |
|---|---|---|---|
| Project: | North Maybe Mine TCRA | Personnel: JB Brown (J Williams) J Skinner M Hart | |
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 05/02/12 | 1300 |
| Temperature | YSI 556 | / | / |
| Turbidity | Hach 2100 | | |

| | | |
|---|---|---|
| GENERAL | | |
| Date: MAY 02, 2012 | Location: IA1-28A | Circle: (SW) GW |
| Time: 1425 | Lat. | Long. |
| SAMPLING CONDITIONS | | |
| Sampling Method: GRAB | Depth Sample Taken: SW | |
| Water Level BTC (ft): | Well Depth BTC (ft): | |
| Water Appearance: CLEAR - NO ODOR | | |
| Stream Flow: NOT MEASURED - POND | | |

FIELD MEASUREMENTS

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 8.41 | 399 | 7.30 | 170.6 | 80.0 | 9.35 | 0.94 |
| | | | | | | |
| | | | | | | |

| SAMPLES COLLECTED | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) / (Filtered) |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature: J B. Williams Date: 05/02/12

## FIELD WATER QUALITY SAMPLING FORM

| Project: | North Maybe Mine TCRA | Personnel: JB Brown (J Williams) J Skinner M Hart | |
|---|---|---|---|
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 05/02/12 | 1300 |
| Temperature | YSI 556 | / | / |
| Turbidity | Hach 2100 | | |
| GENERAL | | | |
| Date: MAY 02, 2012 | | Location: IA1-55 | Circle: (SW) GW |
| Time: 1445 | | Lat. | Long. |
| SAMPLING CONDITIONS | | | |
| Sampling Method: GRAB | | Depth Sample Taken: SW | |
| Water Level BTC (ft): | | Well Depth BTC (ft): | |
| Water Appearance: CLEAR - NO ODOR | | | |
| Stream Flow: STAFF = 0.425' = 134 GPM | | | |

FIELD MEASUREMENTS

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 6.39 | 381 | 6.63 | 191.2 | 75.6 | 9.30 | 1.13 |
| | | | | | | |
| | | | | | | |

SAMPLES COLLECTED

| | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) ~~Filtered~~ |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature J B. Williams Date: 05/02/12

MAY 02, 2012
MONTHLY TCRA SAMPLING

1300 CALIBRATE YSI 556 MULTI-METER TO THE FOLLOWING STANDARDS:
PH 7.0, GEOTECH, LOT # 2AA510, EXP. JAN/14
PH 10.0, " , LOT # 2AB648, EXP. FEB/14
COND 1413, " , LOT # 2AB308, EXP. FEB/13
ORP 220, " , LOT # 2AB017, EXP. NOV/12
CALIBRATE DO AS PER EQUIPMENT MANUFACTURERS INSTRUCTIONS
BUMP TEST HACH 2100 TURBIDITY METER.
6.64 NTU READS 6.67
57.9 " " 59.0
533 " " 535

1345 ARRIVE AT SITE. COOL, WINDY; FEW THIN CLOUDS, 46°F. A WHITE FORD PICKUP WITH UTAH PLATES - ENTERPRIZE RENTAL IS PARKED AT THE TCRA - ASSUME IT IS E&E SAMPLE CREW.

1405 IA1-30A COLLECT SAMPLE AND BLIND DUP HERE. STAFF AT WEIR READS 0.37'

1425 IA1-28A COLLECT SAMPLE AT SED CONTROL POND STAFF IN POND READS 9.17'

1445 IA1-55 COLLECT SAMPLE. STAFF AT WEIR READS 0.425'

1455 CONDUCT SITE INSPECTION. TALKED TO JOHN WITH E&E - THEY ARE SAMPLING IN EAST MILL CREEK TODAY.

1545 PREPARE SAMPLES, COC, FOR SHIPMENT TO PACE LABS.

James B Willis
05/02/12

**FIELD FORMS**

**JUNE 5, 2012**

## FIELD WATER QUALITY SAMPLING FORM

| Project: | North Maybe Mine TCRA | Personnel: JB Brown (J Williams) J Skinner M Hart | |
|---|---|---|---|
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 06/05/12 1100 | |
| Temperature | YSI 556 | / / | |
| Turbidity | Hach 2100 | | |

**GENERAL**

| | | |
|---|---|---|
| Date: JUNE 05, 2012 | Location: IA1-304 | Circle: (SW) GW |
| Time: 1305 | Lat. Long. | |

**SAMPLING CONDITIONS**

| | |
|---|---|
| Sampling Method: GRAB | Depth Sample Taken: SW |
| Water Level BTC (ft): | Well Depth BTC (ft): |

Water Appearance: CLEAR, NO ODOR

Stream Flow: STAFF READS 0.185' = 17 GPM

**FIELD MEASUREMENTS**

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 11.57 | 551 | 6.89 | 156.7 | 90.4 | 9.83 | 1.13 |
| | | | | | | |
| | | | | | | |

**SAMPLES COLLECTED**

| | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) / (Filtered) |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature: James B. Williams Date: 06/05/12

## FIELD WATER QUALITY SAMPLING FORM

| Project: | North Maybe Mine TCRA | Personnel: JB Brown (J Williams) J Skinner M Hart | |
|---|---|---|---|
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 06/05/12 1100 | |
| Temperature | YSI 556 | / | / |
| Turbidity | Hach 2100 | | |

| GENERAL | | |
|---|---|---|
| Date: JUNE 05, 2012 | Location: JA1-28A | Circle: (SW) GW |
| Time: 1320 | Lat. | Long. |

| SAMPLING CONDITIONS | |
|---|---|
| Sampling Method: GRAB | Depth Sample Taken: SW |
| Water Level BTC (ft): | Well Depth BTC (ft): |
| Water Appearance: CLEAR, NO ODOR, ABUNDANT AQUATIC LIFE | |
| Stream Flow: POND - NOT MEASURED | |

FIELD MEASUREMENTS

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 13.15 | 578 | 7.56 | -200.7 | 132.14 | 13.86 | 1.95 |
| | | | | | | |
| | | | | | | |

| SAMPLES COLLECTED | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) / Filtered |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature J B. Williams Date: 06/05/12

BLIND DUP
DUP-060512-A
@ 1245

## FIELD WATER QUALITY SAMPLING FORM

| Project: | North Maybe Mine TCRA | Personnel: JB Brown (J Williams) J Skinner M Hart |
|---|---|---|
| Instruments: | | Date and Time Instrument Calibrated |
| Conductivity, pH, Eh, DO | YSI 556 | 06/05/12 1100 |
| Temperature | YSI 556 | / / |
| Turbidity | Hach 2100 | |

| GENERAL | | |
|---|---|---|
| Date: JUNE 05, 2012 | Location: IA1-55 | Circle: (SW) GW |
| Time: 1340 | Lat. | Long. |

| SAMPLING CONDITIONS | |
|---|---|
| Sampling Method: GRAB | Depth Sample Taken: SW |
| Water Level BTC (ft): | Well Depth BTC (ft): |
| Water Appearance: CLEAR - NO ODOR | |
| Stream Flow: STAFF READS 0.240' = 32 GPM | |

FIELD MEASUREMENTS

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 6.83 | 501 | 6.69 | 130.5 | 75.7 | 9.20 | 0.54 |
| | | | | | | |
| | | | | | | |

| SAMPLES COLLECTED | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) / (Filtered) |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature J B. Williams Date: 06/05/12

JUNE 05, 2012

MONTHLY TCRA SAMPLING

1100 CALIBRATE YSI 556 MULTI-METER TO THE FOLLOWING STANDARDS:

PH 7.0, GEOTECH, LOT # 2AA510, EXP. JAN/14
PH 10.0, " , LOT # 2ABG48, EXP. FEB/14
COND 1413, " , LOT # 2AB388, EXP. FEB/13
ORP 220, " , LOT # 2AB017, EXP. NOV/12

CALIBRATE DO AS PER EQUIPMENT MANUFACTURERS INSTRUCTIONS.

BUMP TEST HACH 2100 TURBIDITY METER;

| | | |
|---|---|---|
| 6.05 | NTU READS | 6.24 |
| 57.3 | " " | 58.1 |
| 538 | " " | 538 |

1230 ARRIVE AT SITE, SUNNY, WARM, SLIGHT BREEZE, 59°F

1305 IA1-30A COLLECT SAMPLE AT LOWER WEIR STAFF GUAGE READS. 0.185'

1320 IA1-28A COLLECT SAMPLE IN SED CONTROL POND. STAFF IN POND READS: 8.95
BLIND DUP HERE: DUP-060512-A @1245

1340 IA1-55 COLLECT SAMPLE AT UPPER WEIR. STAFF GUAGE READS: 0.240

1350 CONDUCT SITE INSPECTION.

1430 PREP SAMPLES, COC, FOR SHIPMENT TO PACE.

James B. Williams
06/05/12

**FIELD FORMS**

**JULY 5, 2012**

## FIELD WATER QUALITY SAMPLING FORM

| Project: | North Maybe Mine TCRA | Personnel: JB Brown (J Williams) J Skinner M Hart | |
|---|---|---|---|
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 07/05/12 0930 | |
| Temperature | YSI 556 | / / | |
| Turbidity | Hach 2100 | | |
| GENERAL | | | |
| Date: July 05, 2012 | | Location: IA1-30A | Circle: (SW) GW |
| Time: 1045 | | Lat. | Long. |
| SAMPLING CONDITIONS | | | |
| Sampling Method: GRAB | | Depth Sample Taken: SW | |
| Water Level BTC (ft): | | Well Depth BTC (ft): | |
| Water Appearance: CLEAR, NO ODOR, LOW FLOW | | | |
| Stream Flow: 0.120' ON STAFF = 5.76 GPM | | | |

FIELD MEASUREMENTS

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 11.97 | 594 | 6.55 | 249.3 | 69.2 | 7.42 | 1.79 |
| | | | | | | |
| | | | | | | |

SAMPLES COLLECTED

| | | |
|---|---|---|
| General Indicators & Anions - Unpreserved: | 2 | (Raw) / Filtered |
| Metals & Cations - Nitric Acid Preserved: | | (Raw) / (Filtered) |
| Total Suspended Solids - Unpreserved: | | Raw / Filtered |
| Organics - Unpreserved: | | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | | Raw / Filtered |

Sampler's Signature: James B. Williams Date: 07/05/12

## FIELD WATER QUALITY SAMPLING FORM

| Project: | North Maybe Mine TCRA | Personnel: JB Brown (J Williams) J Skinner M Hart | |
|---|---|---|---|
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 07/05/12 | 0930 |
| Temperature | YSI 556 | / | / |
| Turbidity | Hach 2100 | | |
| GENERAL | | | |
| Date: July 05, 2012 | | Location: IA1-28A | Circle: (SW) GW |
| Time: 1055 | | Lat. | Long. |
| SAMPLING CONDITIONS | | | |
| Sampling Method: GRAB | | Depth Sample Taken: SW | |
| Water Level BTC (ft): | | Well Depth BTC (ft): | |
| Water Appearance: CLEAR, NO ODOR, FLOATING ORGANICS & DEBRIS | | | |
| Stream Flow: POND - NOT MEASURED | | | |

FIELD MEASUREMENTS

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 13.94 | 605 | 8.47 | 158.9 | 174.5 | 17.83 | 3.39 |
| | | | | | | |
| | | | | | | |

SAMPLES COLLECTED

| | |
|---|---|
| General Indicators & Anions - Unpreserved: | 2 (Raw) / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) / (Filtered) |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature James B. Williams Date: 07/05/12

## FIELD WATER QUALITY SAMPLING FORM

| | | | |
|---|---|---|---|
| Project: | North Maybe Mine TCRA | Personnel: | JB Brown (J Williams) J Skinner M Hart |
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 07/05/12 | 0930 |
| Temperature | YSI 556 | / | / |
| Turbidity | Hach 2100 | | |

| GENERAL | | | |
|---|---|---|---|
| Date: July 05, 2012 | Location: IA1-55 | Circle: (SW) GW | |
| Time: 1115 | Lat. | Long. | |

| SAMPLING CONDITIONS | |
|---|---|
| Sampling Method: GRAB | Depth Sample Taken: SW |
| Water Level BTC (ft): | Well Depth BTC (ft): |
| Water Appearance: CLEAR, NO ODOR, LOW FLOW | |
| Stream Flow: STAFF READS 0.195' = 1960M | |

FIELD MEASUREMENTS

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 7.06 | 542 | 7.04 | 191.2 | 71.8 | 8.68 | 1.46 |
| | | | | | | |
| | | | | | | |

| SAMPLES COLLECTED | |
|---|---|
| General Indicators & Anions - Unpreserved: | 2 (Raw) / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) / (Filtered) |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature: James B. Williams Date: 07/05/12

BLIND DUP HERE
DUP-070512-A
@1130

JULY 05, 2012

MONTHLY TCRA SAMPLING

0930 CALIBRATE YSI 556 MULTI-METER FOLLOWING STANDARDS:

PH 7.0, GEOTECH, LOT# 2AA510, EXP. JAN/1[illegible]
PH 10.0, " , LOT# 2AB648, EXP. FEB/1[illegible]
CONDI413, " , LOT# 2AB388, EXP. FEB/1[illegible]
ORP 220, " , LOT# 2AB017, EXP. NOV/12

CALIBRATE DO AS PER EQUIPMENT MANUFACTURER INSTRUCTIONS.

BUMP TEST HACH 2100 TURBIDITY METER:

6.05 NTU READS 6.12
57.3 " " 56.4
538 " " 541

1030 ARRIVE AT SITE, COOL, OVERCAST, LIGHT RAIN, CALM. 61° F

1045 IA1-30A COLLECT SAMPLE AT LOWER WEIR STAFF READS: 0.120'

1055 IA1-28A COLLECT SAMPLE AT SED POND. STAFF IN POND READS 8.9'

1115 IA1-55 COLLECT SAMPLE AT TOE OF ENERGY DISSIPATOR (UPPER WEIR) STAFF READS 0.195' COLLECT BLIND DUP HERE: DUP-070512-A @ 1130.

1120 CONDUCT SITE INSPECTION.

1145 PREP SAMPLES, COC, FOR SHIPMENT TO PACE LABORATORIES.

James B. Williams
07/05/12

**FIELD FORMS**

**AUGUST 6, 2012**

## FIELD WATER QUALITY SAMPLING FORM

| Project: | North Maybe Mine TCRA | Personnel: JB Brown (J Williams) J Skinner M Hart | |
|---|---|---|---|
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 08/06/12 | 1015 |
| Temperature | YSI 556 | / | / |
| Turbidity | Hach 2100 | | |
| GENERAL | | | |
| Date: August 06, 2012 | | Location: IA1-30A | Circle: (SW) GW |
| Time: 1135 | | Lat. | Long. |
| SAMPLING CONDITIONS | | | |
| Sampling Method: GRAB | | Depth Sample Taken: SW | |
| Water Level BTC (ft): | | Well Depth BTC (ft): | |
| Water Appearance: CLEAR, LOW VOLUME, NO ODOR | | | |
| Stream Flow: STAFF READ 0.100' = 3.6 GPM, 0.008 CFS | | | |

FIELD MEASUREMENTS

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 13.16 | 639 | 6.35 | 191.8 | 65.6 | 6.88 | 0.94 |
| | | | | | | |
| | | | | | | |

SAMPLES COLLECTED

| | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) / (Filtered) |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature J B Williams Date: 08/06/12

BLIND DUP HERE:
DUP-080612-A
@ 1100

## FIELD WATER QUALITY SAMPLING FORM

| | | | |
|---|---|---|---|
| Project: | North Maybe Mine TCRA | Personnel: | JB Brown, J Williams, J Skinner, M Hart |
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 08/06/12 1015 | |
| Temperature | YSI 556 | / | / |
| Turbidity | Hach 2100 | | |

**GENERAL**

| | | |
|---|---|---|
| Date: August 06, 2012 | Location: IAL-28A | Circle: (SW) GW |
| Time: 1150 | Lat. | Long. |

**SAMPLING CONDITIONS**

| | |
|---|---|
| Sampling Method: GRAB | Depth Sample Taken: SW |
| Water Level BTC (ft): | Well Depth BTC (ft): |

Water Appearance: SLIGHTLY TURBID, GREEN, ABUNDANT ORGANICS, SLIGHT ORGANIC ODOR

Stream Flow: POND - NOT MEASURED

**FIELD MEASUREMENTS**

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 15.50 | 650 | 8.47 | 103.9 | 151.6 | 15.11 | 8.30 |
| | | | | | | |
| | | | | | | |

**SAMPLES COLLECTED**

| | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) / (Filtered) |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature: J B. Williams Date: 08/06/12

## FIELD WATER QUALITY SAMPLING FORM

| | | | |
|---|---|---|---|
| Project: | North Maybe Mine TCRA | Personnel: | JB Brown (J Williams) J Skinner M Hart |
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 08/06/12 | 1015 |
| Temperature | YSI 556 | / | / |
| Turbidity | Hach 2100 | | |

**GENERAL**

| | | |
|---|---|---|
| Date: AUGUST 06, 2012 | Location: IA1-55 | Circle: (SW) GW |
| Time: 1205 | Lat. | Long. |

**SAMPLING CONDITIONS**

| | |
|---|---|
| Sampling Method: GRAB | Depth Sample Taken: SW |
| Water Level BTC (ft): | Well Depth BTC (ft): |

Water Appearance: CLEAR, NO ODOR

Stream Flow: STAFF READS 0.180' = 16.0 GPM, 0.035 CFS

**FIELD MEASUREMENTS**

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 7.35 | 577 | 7.05 | 131.3 | 80.1 | 9.60 | 0.50 |
| | | | | | | |
| | | | | | | |

**SAMPLES COLLECTED**

| | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) (Filtered) |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature J. B. Williams Date: 08/06/12

AUGUST 06, 2012

MONTHLY TCRA SAMPLING

1015 CALIBRATE YSI 556 MULTI-METER TO THE FOLLOWING STANDARDS:

PH 7.0, GEOTECH, LOT # ZAA510, EXP. JAN/14
PH 10.0, " , LOT # ZAB648, EXP. FEB/14
COND 1413, " , LOT # ZAB388, EXP. FEB/13
ORP 220, " , LOT # ZAC215, EXP DEC/12

CALIBRATE DO AS PER EQUIPMENT MANUFACTURERS INSTRUCTIONS.

BUMP TEST HACH 2100 TURBIDITY METER:

| | | |
|---|---|---|
| 6.05 | NTU READS | 6.06 |
| 57.3 | " " | 57.9 |
| 538 | " " | 537 |

1100 ARRIVE AT SITE, WARM, PARTLY CLOUDY, SLIGHT BREEZE ~ 74° F. OBSERVE SCOURING IN ROAD DITCH FROM TOP OF ROAD DOWN TO PIT. MUCH LESS BELOW PIT.

1135 IA1-30A COLLECT SAMPLE AND BLIND DUP HERE. STAFF AT WEIR READS: 0.100'

1150 IA1-28A COLLECT SAMPLE FROM SED POND. STAFF IN POND 8.90'

1205 IA1-55 COLLECT SAMPLE, STAFF IN WEIR READS 0.180'

1215 CONDUCT SITE INSPECTION. PREP SAMPLES FOR SHIPMENT TO PACE.

1400 RETURN TO DRY VALLEY

James B. Wilkinson
08/06/12

# FIELD FORMS

## SEPTEMBER 4, 2012

## FIELD WATER QUALITY SAMPLING FORM

| Project: | North Maybe Mine TCRA | Personnel: JB Brown (J Williams) J Skinner M Hart | |
|---|---|---|---|
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 09/04/12 | 0945 |
| Temperature | YSI 556 | / | / |
| Turbidity | Hach 2100 | | |

SW GENERAL

| Date: SEPT. ~~AUGUST~~ 04, 2012 | Location: IA(-30 A | Circle: (SW) GW |
|---|---|---|
| Time: 1045 | Lat. | Long. |

SAMPLING CONDITIONS

| Sampling Method: GRAB | Depth Sample Taken: SW |
|---|---|
| Water Level BTC (ft): | Well Depth BTC (ft): |

Water Appearance: CLEAR, NO ODOR, LOW FLOW

Stream Flow: STAFF READS 0.08' = 2.1 GPM

FIELD MEASUREMENTS

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 10.71 | 6.59 | 6.56 | 226.7 | 53.6 | 5.92 | 1.55 |
| | | | | | | |
| | | | | | | |

SAMPLES COLLECTED

| | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) / (Filtered) |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature: James B. Williams Date: 09/04/12

## FIELD WATER QUALITY SAMPLING FORM

| | | | |
|---|---|---|---|
| Project: | North Maybe Mine TCRA | Personnel: JB Brown (J Williams) J Skinner M Hart | |
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 09/04/12 0945 | |
| Temperature | YSI 556 | / / | |
| Turbidity | Hach 2100 | | |

JBW

**GENERAL**

| | | |
|---|---|---|
| Date: ~~AUGUST~~ SEPT. 04, 2012 | Location: IA1-28A | Circle: (SW) GW |
| Time: 1100 | Lat. Long. | |

**SAMPLING CONDITIONS**

| | |
|---|---|
| Sampling Method: GRAB | Depth Sample Taken: SW |
| Water Level BTC (ft): | Well Depth BTC (ft): |

Water Appearance: GREEN HUE, NO ODOR, ABUNDANT ORGANIC/AQUATIC LIFE

Stream Flow: POND - NOT MEASURED

**FIELD MEASUREMENTS**

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 12.30 | 670 | 8.51 | 132.4 | 105.6 | 11.30 | 5.37 |
| | | | | | | |
| | | | | | | |

**SAMPLES COLLECTED**

| | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) / (Filtered) |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature: Jon B. Will Date: 09/04/12

BLIND DUP HERE:
DUP-090412-A
@ 1030

## FIELD WATER QUALITY SAMPLING FORM

| | | | |
|---|---|---|---|
| Project: | North Maybe Mine TCRA | Personnel: JB Brown, J Williams, Skinner, M Hart | |
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 09/04/12 | 0945 |
| Temperature | YSI 556 | / | / |
| Turbidity | Hach 2100 | | |

| | | |
|---|---|---|
| GENERAL | | |
| Date: ~~Aug~~ SEPT. 04, 2012 | Location: IA1-55 | Circle: (SW) GW |
| Time: 1125 | Lat. | Long. |
| SAMPLING CONDITIONS | | |
| Sampling Method: GRAB | Depth Sample Taken: SW | |
| Water Level BTC (ft): | Well Depth BTC (ft): | |
| Water Appearance: CLEAR, NO ODOR | | |
| Stream Flow: STAFF READS 0.17' = 1K GPM | | |

FIELD MEASUREMENTS

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 6.99 | 613 | 7.36 | 158.0 | 70.8 | 8.55 | 0.65 |
| | | | | | | |
| | | | | | | |

| SAMPLES COLLECTED | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | ~~Raw~~ (Filtered) |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature: James B. Williams Date: 09/04/12

SEPTEMBER 04, 2012
MONTHLY TCRA SAMPLING
0945 CALIBRATE YSI 556 MULTI-METER FOLLOWING STANDARDS:
PH 7.0, GEOTECH, LOT# ZAA510, EXP.
PH 10.0, " , LOT# ZAB648, EXP.
COND 1413, " , LOT# ZAB388, EXP.
ORP 220, " , LOT# ZAC215, EXP.
CALIBRATE DO AS PER EQUIPMENT MANUFACTURERS INSTRUCTIONS.
BUMP TEST HACH 2100 TURBIDITY METER
6.22 NTU READS 5.99
57.7 " " 57.6
518 " " 521
1030 ARRIVE AT SITE. WARM, CLEAR, BREEZY, ~60°F.
1045 IA1-30A COLLECT SAMPLE. STAFF AT WEIR READS 0.08'
1100 IA1-28A COLLECT SAMPLE AND BLIND DUP HERE. STAFF IN POND READS ~8.75'
1125 IA1-55 COLLECT SAMPLE AT TOE. STAFF IN WEIR READS ~~0~~ 0.17'
1135 FILTER SAMPLES, CONDUCT SITE INSPECTION
1215 DEPART SITE.
1715 PREP SAMPLES, COC, FOR SHIPMENT TO PACE.

John B Williams
09/04/12

# FIELD FORMS

## OCTOBER 1, 2012

## FIELD WATER QUALITY SAMPLING FORM

| | | | |
|---|---|---|---|
| Project: | North Maybe Mine TCRA | Personnel: JB Brown (J Williams) J Skinner M Hart | |
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 10/01/12 | 1130 |
| Temperature | YSI 556 | / | / |
| Turbidity | Hach 2100 | | |
| GENERAL | | | |
| Date: OCT. 01, 2012 | | Location: IA1-30 A | Circle: (SW) GW |
| Time: 1240 | | Lat. | Long. |
| SAMPLING CONDITIONS | | | |
| Sampling Method: GRAB | | Depth Sample Taken: SW | |
| Water Level BTC (ft): | | Well Depth BTC (ft): | |
| Water Appearance: CLEAR, NO ODOR, LOW FLOW | | | |
| Stream Flow: STAFF READS 0.075' = 1.8 GPM | | | |

FIELD MEASUREMENTS

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 11.26 | 703 | 6.81 | 146.9 | 66.5 | 7.26 | 1.63 |
| | | | | | | |
| | | | | | | |

SAMPLES COLLECTED

| | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) / ~~Filtered~~ |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature James B. Williams Date: 10/01/12

## FIELD WATER QUALITY SAMPLING FORM

| Project: | North Maybe Mine TCRA | Personnel: JB Brown (J Williams) J Skinner M Hart | |
|---|---|---|---|
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 10/01/12 1130 | |
| Temperature | YSI 556 | / / | |
| Turbidity | Hach 2100 | | |
| GENERAL | | | |
| Date: Oct. 01, 2012 | | Location: IA1-28A | Circle: (SW) GW |
| Time: 1255 | | Lat. | Long. |
| SAMPLING CONDITIONS | | | |
| Sampling Method: GRAB | | Depth Sample Taken: SW | |
| Water Level BTC (ft): | | Well Depth BTC (ft): | |
| Water Appearance: Bright green hue, no odor, abundant organic life | | | |
| Stream Flow: No flow out | | | |

FIELD MEASUREMENTS

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 10.92 | 676 | 8.49 | 96.7 | 145.8 | 16.08 | 4.70 |
| | | | | | | |
| | | | | | | |

SAMPLES COLLECTED

| | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) / ~~Filtered~~ |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature J. B. Will Date: 10/01/12

## FIELD WATER QUALITY SAMPLING FORM

| | | | |
|---|---|---|---|
| Project: | North Maybe Mine TCRA | Personnel: | JB Brown (J Williams) J Skinner M Hart |
| Instruments: | | Date and Time Instrument Calibrated | |
| Conductivity, pH, Eh, DO | YSI 556 | 10/01/12 | 1130 |
| Temperature | YSI 556 | / | / |
| Turbidity | Hach 2100 | | |

| GENERAL | | |
|---|---|---|
| Date: OCT. 01, 2012 | Location: IA1-55 | Circle: (SW) GW |
| Time: 1310 | Lat. | Long. |

| SAMPLING CONDITIONS | |
|---|---|
| Sampling Method: GRAB | Depth Sample Taken: SW |
| Water Level BTC (ft): | Well Depth BTC (ft): |
| Water Appearance: CLEAR, NO ODOR | |
| Stream Flow: STAFF READS 0.175' = 15 GPM | |

FIELD MEASUREMENTS

| Temperature (°C) | Conductivity (uS/cm) | pH | Eh (ORP) | DO % | DO mg/l | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 6.92 | 550 | 6.97 | 115.3 | 76.2 | 9.24 | 0.55 |
| | | | | | | |
| | | | | | | |

| SAMPLES COLLECTED | |
|---|---|
| General Indicators & Anions - Unpreserved: | Raw / Filtered |
| Metals & Cations - Nitric Acid Preserved: | (Raw) / (Filtered) |
| Total Suspended Solids - Unpreserved: | Raw / Filtered |
| Organics - Unpreserved: | Raw / Filtered |
| Organics - Sulfuric Acid Preserved: | Raw / Filtered |

Sampler's Signature: J B. Williams Date: 10/01/12

BLIND DUP HERE:
DUP-100112-A
@1330

OCTOBER 01, 2012

MONTHLY TCRA SAMPLING

1130 CALIBRATE YSI 556 MULTI METER TO THE FOLLOWING STANDARDS:

PH 7.0, GEOTECH, LOT # 2AA510, EXP JAN/14
PH 10.0, " , LOT # 2AB648, EXP FEB/14
COND 1413, " , LOT # 2AB388, EXP FEB/13
ORP 220, " , LOT # 2AC215, EXP DEC/12

CALIBRATE DO AS PER EQUIPMENT MANUFACTURERS INSTRUCTIONS.

BUMP TEST HACH 2100 TURBIDITY METER:

6.22 NTU READS 6.07
57.7 " " 57.0
518 " " 522

1215 ARRIVE AT SITE. WARM, CLEAR, SUNNY, CALM DAY ~ 65°F

1240 IA1-30A COLLECT SAMPLE. STAFF AT WEIR READS 0.075'

1255 IA1-28A COLLECT SAMPLE FROM SED POND. STAFF IN POND READS: ~8.7'

1310 IA1-55 COLLECT SAMPLE AND BLIND DUP HERE (DUP-100112-A @ 1330). STAFF IN WEIR READS 0.175'

1340 FILTER SAMPLES, CONDUCT SITE INSPECTION

1410 DEPART SITE

1430 PREP SAMPLES, COC, FOR SHIPMENT TO PACE.

James B. Williams

10/01/12

# APPENDIX D

# 2012 QA/QC SUMMARY REPORT AND LABORATORY REPORTS

# 2012 QA/QC SUMMARY REPORT

# Appendix D
# North Maybe Mine
# 2012 QA/QC SUMMARY

## 1.0 DATA VALIDATION SUMMARY

This document describes the quality of the data collected for this investigation for surface water samples collected in May through October 2012. The data validation is summarized below including any qualification or rejection of data. The data were validated using criteria and qualifiers as provided in the USEPA National Functional Guidelines for Inorganic Data Review (NFGs) (EPA, October 2004). This summary includes the validation of 24 surface water samples, including field duplicates.

This section describes the different types of quality issues that are reviewed during data validation and then summarizes the issues that affected the samples. Table 1 lists all of the items that were outside of acceptance limits and notes the number of samples for each item that were qualified and the qualifier.

### 1.1 Preservation and Holding Time

Preservation is the change in pH and/or temperature that is required for a sample between collection and analysis. At times, a sample may be received by the laboratory at a temperature that is less than (<) or greater than (>) the specified temperature criteria of 4 degrees Celsius (°C) plus-or-minus (±) 2 °C (i.e., if chilling is required). If this occurs, professional judgment is used to determine if this temperature deviation has affected the quality of the results for that sample. For this set of samples, all samples were within the specified temperature range, with the exception of samples received May 4 at 0.4 °C (samples collected May 2, 2012 [IA1-55-050212, IA1-28A-050212, IA1-30A-050212, and Dup-050212-A] and August 8, 2012 at 1.6 °C (samples collected August 6, 2012 [IA1-30A-080612, IA1-28A-080612, IA1-55-080612, and DUP-080612-A]). Note that no sample bottles were frozen and metals are not lost if the temperature criteria are exceeded. No data were qualified as the analytical methods and regulatory criteria do not specify chilling for metals analysis and the Functional Guidelines do not specify qualification of data for metals analysis if samples are not within 4 °C ± 2 °C. The sample receipt temperatures are therefore considered acceptable.

The most common pH preservation for inorganic analyses is the acidification of aqueous samples to a pH of < 2. If this is required and the pH is > 2, it also must be determined if the quality of the data were affected. For this investigation, the pH of the samples were always in

the acceptable range; therefore, there was no judgment made on what unacceptable pHs would affect the quality of the data.

The holding time is the acceptable length of time between collection and analysis of a sample if the preservation was acceptable. For this investigation, all samples were prepared and analyzed within applicable holding times.

### 1.2 Laboratory Blanks

The next items that were reviewed during data validation were the laboratory blank samples. These included calibration blanks, laboratory reagent blanks, and any other types of laboratory blanks included in the laboratory data packages. Laboratory blank samples are contaminant-free media that are analyzed to indicate if there has been possible contamination of the field samples during analysis. If there are detections of constituents in the blank samples above the method detection limit (MDL), then this contamination could possibly have occurred for the field samples.

Any laboratory blank sample result that was > the associated sample MDL was noted during validation. It was then determined, using the criteria from the NFGs, what action, if any, should be taken. If an analyte was detected in a laboratory blank sample, action may have been taken based on the NFGs. These actions may have included; 1) changing the sample result to the practical quantitation limit (PQL) and qualifying this result as nondetect (U), 2) changing the sample result to the blank value and qualifying this result as nondetect (U), or 3) qualifying the original sample result as nondetect (U). Because blank results are usually very low, any blank detection would usually affect only sample results at very low concentrations at/or near the detection limits and, therefore, should not affect the investigation unless an action level is very near the detection limit.

There were no blank detections greater than the PQL associated with reported sample results for this investigation. For blank detections below the PQL, any associated sample results less than 10 times the blank value and less than the PQL are changed to the PQL and qualified as nondetect (U). For blank detections below PQL, associated sample results less than 10 times

the blank value but greater than the PQL are not required to be qualified by the Functional Guidelines using professional judgment. As all sample results associated with blank detections were significantly greater than 10 times the blank value; therefore, no sample results required qualification.

### 1.3 Laboratory Control Samples

A laboratory control sample (LCS) is contaminant-free media that has been spiked with a known amount of specified constituents to determine the accuracy of the analysis. This is measured by determining the percent recovery (%R) of the LCS. Control limits are specified for recoveries for each method. If the %R is less than the lower control limit (< LCL), then the constituent is not being completely recovered and associated detected results are qualified with a "J-" and are considered estimated for potential low bias and associated nondetects are either considered estimated and qualified with a "UJ-" or rejected (i.e., unusable) and qualified with an "R." If the %R is greater than the upper control limit (> UCL), the associated detected results are qualified with a "J+" and are considered estimated for potential high bias and associated nondetects are not qualified. All LCS results associated with reported sample results for this investigation were within acceptable control limits, and no data were qualified.

### 1.4 Matrix Spike/Matrix Spike Duplicate Analysis

Matrix spike/matrix spike duplicate (MS/MSD) samples (e.g., laboratory fortified matrix) are field samples that have been spiked with a known amount of a constituent. The %R is determined for each MS and MSD sample. If the %R is < LCL, the detections are qualified with a "J-" and are considered estimated for potential low bias and the nondetects are either considered estimated and qualified with a "UJ-" or rejected (i.e., unusable) and qualified with an "R." If the %R is > UCL, the associated detected results are qualified with a "J+" and are considered estimated for potential high bias and associated nondetects are not qualified. For sample results that exceed four-times the concentration of the spike, spike recovery limits do not apply and the data are not considered to exceed acceptance criteria, even if the %Rs do not meet the specified control limits, as specified in the Functional Guidelines. All MS/MSD results were within the acceptance criteria, with the following exceptions.

The percent recoveries (%Rs) of 128% and 130% for dissolved zinc in the MS/MSD and 126% for dissolved vanadium in the MS analyses of sample IA1-30A-090412 (10204498-001) exceeded the 75-125%R control limits for metals. The associated results for dissolved vanadium and zinc were qualified as estimated (J+) for potential minor high bias. The associated results for total vanadium and zinc were also qualified as estimated (J+) for potential minor high bias as no project-specific MS/MSD was analyzed for total metals for this SDG.

The analytes qualified for MS/MSD outliers with the number of samples that were affected for each media are listed in Table 1.

For the duplicate analysis (MS/MSD), the relative percent difference (RPD) is calculated unless one or both of the results are nondetect (which are not evaluated). If the RPD is greater than the acceptable criteria as noted in the NFGs, the results may be qualified as either estimated (J) or nondetect estimated (UJ). All RPDs were within the acceptance criteria.

### 1.6 Overall Quality on Data Validation Results

Four results were qualified as estimated (J+) for marginally high matrix spike recoveries. These results may be biased slightly high. No other data were qualified as estimated or rejected; therefore, the data are considered usable for their intended purposes.

## 2.0 FIELD DUPLICATE SUMMARY

In 2012 for this investigation, six surface water field duplicate samples were collected for 18 parent samples. The results of these field duplicate samples and their parent samples are listed in Table 2. These field duplicate sample results were compared to their parent sample results by using the following rules:

- The RPD is calculated for each set of results. If the RPD is within the range of ±30, then the results are acceptable.

- If the RPD is not within the range of ±30 then it is determined if either result is < 5 times the practical quantitation limit (PQL). If neither is < 5 times the PQL, then the results are not considered acceptable.

- If one or both of the results are < 5 times the PQL, then the difference between the results is compared. If the difference between the results is < 2 times the PQL, then the results are considered acceptable.

Table 2 contains a column with the calculated RPDs. If the RPD is not calculable (one or both results is nondetect and, therefore, has no value), "NC" has been placed in this column. For anion/cation balance, RPD is not applicable, as this is a ratio. For the remaining values, the above rules were applied. The next column notes if the results were acceptable based on the difference between them (i.e., one or both of the results was < 5 times the PQL). All field duplicate sample pair results were acceptable.

### 2.1 Overall Quality Based on Field Duplicate Results

Because all field duplicate sample pair results were acceptable, there were no quality issues with the data based on the field duplicate results.

## 3.0 FIELD BLANK SUMMARY

In 2012 for this investigation, no field blanks were collected as all samples were collected using disposable equipment.

## Table 1 Data Validation Summary, Surface Water, 2012

| SURFACE WATER Total No. of Samples = 24 | Cadmium | | Chromium | | Nickel | | Selenium | | Vanadium | | Zinc | | Calcium | Magnesium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Dissolved |
| MS/MSD (J+) | | | | | | | | | 4 | 4 | 4 | 4 | | |

Note: No samples were qualified as U at the practical quantitation limit.

| SURFACE WATER Total No. of Samples = 24 | Calcium | Magnesium | Potassium | Potassium | Sodium | Chloride | Sulfate | Bicarbonate Alkalinity | Carbonate Alkalinity | Hydroxide Alkalinity | Total Alkalinity | Sum of Anions | Sum of Cations | Cation-Anion Balance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Total | Dissolved | Total | Total and Dissolved | | | | | | | | | |
| None | | | | | | | | | | | | | | |

## Table 2 Field Duplicate Results, Surface Water, 2012

| Sample Name | Media | Analyte | Fraction | Result (mg/L) | PQL | L | V | Duplicate Name | Analyte | Fraction | Result (mg/L) | PQL | L | V | RPD | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IA1-30A-050212 | SW | Cadmium | Total | 0.0015 | 0.00008 | | | Dup-050212-A | Cadmium | Total | 0.0014 | 0.00008 | | | 7 | |
| IA1-30A-050212 | SW | Cadmium | Dissolved | 0.0014 | 0.00008 | | | Dup-050212-A | Cadmium | Dissolved | 0.0014 | 0.00008 | | | 0 | |
| IA1-30A-050212 | SW | Calcium | Dissolved | 82.6 | 0.1 | | | Dup-050212-A | Calcium | Dissolved | 83.6 | 0.1 | | | -1 | |
| IA1-30A-050212 | SW | Chromium | Total | 0.017 | 0.0005 | | | Dup-050212-A | Chromium | Total | 0.016 | 0.0005 | | | 6 | |
| IA1-30A-050212 | SW | Chromium | Dissolved | 0.017 | 0.0005 | | | Dup-050212-A | Chromium | Dissolved | 0.017 | 0.0005 | | | 0 | |
| IA1-30A-050212 | SW | Magnesium | Dissolved | 19.7 | 0.005 | | | Dup-050212-A | Magnesium | Dissolved | 19.5 | 0.005 | | | 1 | |
| IA1-30A-050212 | SW | Nickel | Total | 0.014 | 0.0005 | | | Dup-050212-A | Nickel | Total | 0.013 | 0.0005 | | | 7 | |
| IA1-30A-050212 | SW | Nickel | Dissolved | 0.013 | 0.0005 | | | Dup-050212-A | Nickel | Dissolved | 0.013 | 0.0005 | | | 0 | |
| IA1-30A-050212 | SW | Selenium | Total | 2.3 | 0.005 | | | Dup-050212-A | Selenium | Total | 2.2 | 0.0025 | | | 4 | |
| IA1-30A-050212 | SW | Selenium | Dissolved | 2.2 | 0.0025 | | | Dup-050212-A | Selenium | Dissolved | 2.2 | 0.0025 | | | 0 | |
| IA1-30A-050212 | SW | Vanadium | Total | 0.049 | 0.0001 | | | Dup-050212-A | Vanadium | Total | 0.047 | 0.0001 | | | 4 | |
| IA1-30A-050212 | SW | Vanadium | Dissolved | 0.049 | 0.0001 | | | Dup-050212-A | Vanadium | Dissolved | 0.048 | 0.0001 | | | 2 | |
| IA1-30A-050212 | SW | Zinc | Total | 0.058 | 0.005 | | | Dup-050212-A | Zinc | Total | 0.056 | 0.005 | | | 4 | |
| IA1-30A-050212 | SW | Zinc | Dissolved | 0.057 | 0.005 | | | Dup-050212-A | Zinc | Dissolved | 0.056 | 0.005 | | | 2 | |
| IA1-30A-050212 | SW | Total Hardness | Dissolved | 288 | 0.36 | | | Dup-050212-A | Total Hardness | Dissolved | 289 | 0.36 | | | 0 | |
| IA1-28A-060512 | SW | Cadmium | Total | 0.0019 | 0.00008 | | | DUP-060512-A | Cadmium | Total | 0.0018 | 0.00008 | | | 5 | |
| IA1-28A-060512 | SW | Cadmium | Dissolved | 0.0017 | 0.00008 | | | DUP-060512-A | Cadmium | Dissolved | 0.0018 | 0.00008 | | | -6 | |
| IA1-28A-060512 | SW | Calcium | Dissolved | 97.4 | 0.1 | | | DUP-060512-A | Calcium | Dissolved | 99.9 | 0.1 | | | -3 | |
| IA1-28A-060512 | SW | Chromium | Total | 0.0076 | 0.0005 | | | DUP-060512-A | Chromium | Total | 0.0076 | 0.0005 | | | 0 | |
| IA1-28A-060512 | SW | Chromium | Dissolved | 0.0074 | 0.0005 | | | DUP-060512-A | Chromium | Dissolved | 0.0079 | 0.0005 | | | -7 | |
| IA1-28A-060512 | SW | Magnesium | Dissolved | 20.3 | 0.005 | | | DUP-060512-A | Magnesium | Dissolved | 21.1 | 0.005 | | | -4 | |
| IA1-28A-060512 | SW | Nickel | Total | 0.015 | 0.0005 | | | DUP-060512-A | Nickel | Total | 0.015 | 0.0005 | | | 0 | |
| IA1-28A-060512 | SW | Nickel | Dissolved | 0.015 | 0.0005 | | | DUP-060512-A | Nickel | Dissolved | 0.015 | 0.0005 | | | 0 | |
| IA1-28A-060512 | SW | Selenium | Total | 1.7 | 0.0025 | | | DUP-060512-A | Selenium | Total | 1.8 | 0.0025 | | | -6 | |
| IA1-28A-060512 | SW | Selenium | Dissolved | 1.9 | 0.0025 | | | DUP-060512-A | Selenium | Dissolved | 1.9 | 0.0025 | | | 0 | |
| IA1-28A-060512 | SW | Vanadium | Total | 0.044 | 0.0001 | | | DUP-060512-A | Vanadium | Total | 0.042 | 0.0001 | | | 5 | |
| IA1-28A-060512 | SW | Vanadium | Dissolved | 0.044 | 0.0001 | | | DUP-060512-A | Vanadium | Dissolved | 0.045 | 0.0001 | | | -2 | |
| IA1-28A-060512 | SW | Zinc | Total | 0.064 | 0.005 | | | DUP-060512-A | Zinc | Total | 0.064 | 0.005 | | | 0 | |
| IA1-28A-060512 | SW | Zinc | Dissolved | 0.065 | 0.005 | | | DUP-060512-A | Zinc | Dissolved | 0.067 | 0.005 | | | -3 | |
| IA1-28A-060512 | SW | Total Hardness | Dissolved | 327 | 0.36 | | | DUP-060512-A | Total Hardness | Dissolved | 336 | 0.36 | | | -3 | |
| IA1-55-070512 | SW | Cadmium | Total | 0.0021 | 0.00008 | | | DUP-070512-A | Cadmium | Total | 0.0021 | 0.00008 | | | 0 | |
| IA1-55-070512 | SW | Cadmium | Dissolved | 0.0021 | 0.00008 | | | DUP-070512-A | Cadmium | Dissolved | 0.0020 | 0.00008 | | | 5 | |
| IA1-55-070512 | SW | Calcium | Total | 108 | 0.2 | | | DUP-070512-A | Calcium | Total | 110 | 0.2 | | | -2 | |
| IA1-55-070512 | SW | Calcium | Dissolved | 116 | 0.2 | | | DUP-070512-A | Calcium | Dissolved | 114 | 0.2 | | | 2 | |
| IA1-55-070512 | SW | Chromium | Total | 0.0058 | 0.0005 | | | DUP-070512-A | Chromium | Total | 0.0058 | 0.0005 | | | 0 | |
| IA1-55-070512 | SW | Chromium | Dissolved | 0.0057 | 0.0005 | | | DUP-070512-A | Chromium | Dissolved | 0.0055 | 0.0005 | | | 4 | |
| IA1-55-070512 | SW | Magnesium | Total | 23.7 | 0.05 | | | DUP-070512-A | Magnesium | Total | 23.5 | 0.05 | | | 1 | |
| IA1-55-070512 | SW | Magnesium | Dissolved | 23.8 | 0.05 | | | DUP-070512-A | Magnesium | Dissolved | 21.9 | 0.005 | | | 8 | |
| IA1-55-070512 | SW | Nickel | Total | 0.019 | 0.0005 | | | DUP-070512-A | Nickel | Total | 0.019 | 0.0005 | | | 0 | |
| IA1-55-070512 | SW | Nickel | Dissolved | 0.018 | 0.0005 | | | DUP-070512-A | Nickel | Dissolved | 0.017 | 0.0005 | | | 6 | |
| IA1-55-070512 | SW | Potassium | Total | 1.8 | 0.02 | | | DUP-070512-A | Potassium | Total | 1.8 | 0.02 | | | 0 | |
| IA1-55-070512 | SW | Potassium | Dissolved | 1.9 | 0.02 | | | DUP-070512-A | Potassium | Dissolved | 1.8 | 0.02 | | | 5 | |
| IA1-55-070512 | SW | Selenium | Total | 1.8 | 0.005 | | | DUP-070512-A | Selenium | Total | 1.8 | 0.005 | | | 0 | |
| IA1-55-070512 | SW | Selenium | Dissolved | 2.1 | 0.005 | | | DUP-070512-A | Selenium | Dissolved | 2.0 | 0.005 | | | 5 | |
| IA1-55-070512 | SW | Sodium | Total | 5.2 | 0.05 | | | DUP-070512-A | Sodium | Total | 5.2 | 0.05 | | | 0 | |
| IA1-55-070512 | SW | Sodium | Dissolved | 5.3 | 0.05 | | | DUP-070512-A | Sodium | Dissolved | 5.1 | 0.05 | | | 4 | |
| IA1-55-070512 | SW | Vanadium | Total | 0.037 | 0.0001 | | | DUP-070512-A | Vanadium | Total | 0.037 | 0.0001 | | | 0 | |
| IA1-55-070512 | SW | Vanadium | Dissolved | 0.039 | 0.0001 | | | DUP-070512-A | Vanadium | Dissolved | 0.037 | 0.0001 | | | 5 | |
| IA1-55-070512 | SW | Zinc | Total | 0.083 | 0.005 | | | DUP-070512-A | Zinc | Total | 0.082 | 0.005 | | | 1 | |

## Table 2 Field Duplicate Results, Surface Water, 2012

| Sample Name | Media | Analyte | Fraction | Result (mg/L) | PQL | L | V | Duplicate Name | Analyte | Fraction | Result (mg/L) | PQL | L | V | RPD | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IA1-55-070512 | SW | Zinc | Dissolved | 0.083 | 0.005 | | | DUP-070512-A | Zinc | Dissolved | 0.079 | 0.005 | | | 5 | |
| IA1-55-070512 | SW | Total Hardness | Total | 368 | 0.7 | | | DUP-070512-A | Total Hardness | Total | 372 | 0.7 | | | -1 | |
| IA1-55-070512 | SW | Total Hardness | Dissolved | 388 | 0.7 | | | DUP-070512-A | Total Hardness | Dissolved | 374 | 0.7 | | | 4 | |
| IA1-55-070512 | SW | Chloride | | 3.8 | 2 | | | DUP-070512-A | Chloride | | 3.7 | 2 | | | 3 | |
| IA1-55-070512 | SW | Sulfate | | 194 | 10 | | | DUP-070512-A | Sulfate | | 193 | 10 | | | 1 | |
| IA1-55-070512 | SW | Alkalinity, Carbonate (CaCO3) | | 2.5 | 5 | U | | DUP-070512-A | Alkalinity, Carbonate (CaCO3) | | 2.5 | 5 | U | | 0 | |
| IA1-55-070512 | SW | Alkalinity, Total as CaCO3 | | 173 | 5 | | | DUP-070512-A | Alkalinity, Total as CaCO3 | | 175 | 5 | | | -1 | |
| IA1-55-070512 | SW | Alkalinity,Bicarbonate (CaCO3) | | 173 | 5 | | | DUP-070512-A | Alkalinity,Bicarbonate (CaCO3) | | 175 | 5 | | | -1 | |
| IA1-55-070512 | SW | Total Anions | Calculation | 7.6 | | | | DUP-070512-A | Total Anions | Calculation | 7.6 | | | | 0 | |
| IA1-55-070512 | SW | Total Cations | Calculation | 8.0 | | | | DUP-070512-A | Total Cations | Calculation | 7.7 | | | | 4 | |
| IA1-55-070512 | SW | Cation/Anion Balance | Ratio | 2.8 | | | | DUP-070512-A | Cation/Anion Balance | Ratio | 0.78 | | | | NA | |
| IA1-30A-080612 | SW | Cadmium | Total | 0.00055 | 0.00008 | | | DUP-080612-A | Cadmium | Total | 0.00061 | 0.00008 | | | -10 | |
| IA1-30A-080612 | SW | Cadmium | Dissolved | 0.00056 | 0.00008 | | | DUP-080612-A | Cadmium | Dissolved | 0.00058 | 0.00008 | | | -4 | |
| IA1-30A-080612 | SW | Calcium | Dissolved | NR | 0.2 | | | DUP-080612-A | Calcium | Dissolved | 113 | 0.2 | | | NC | |
| IA1-30A-080612 | SW | Chromium | Total | 0.0056 | 0.0005 | | | DUP-080612-A | Chromium | Total | 0.0047 | 0.0005 | | | 17 | |
| IA1-30A-080612 | SW | Chromium | Dissolved | 0.0050 | 0.0005 | | | DUP-080612-A | Chromium | Dissolved | 0.0049 | 0.0005 | | | 2 | |
| IA1-30A-080612 | SW | Magnesium | Dissolved | | 0.05 | | | DUP-080612-A | Magnesium | Dissolved | 24.4 | 0.05 | | | NC | |
| IA1-30A-080612 | SW | Nickel | Total | 0.0078 | 0.0005 | | | DUP-080612-A | Nickel | Total | 0.0078 | 0.0005 | | | 0 | |
| IA1-30A-080612 | SW | Nickel | Dissolved | 0.0079 | 0.0005 | | | DUP-080612-A | Nickel | Dissolved | 0.0080 | 0.0005 | | | -1 | |
| IA1-30A-080612 | SW | Selenium | Total | 1.7 | 0.025 | | | DUP-080612-A | Selenium | Total | 2.1 | 0.025 | | | -21 | |
| IA1-30A-080612 | SW | Selenium | Dissolved | 1.8 | 0.025 | | | DUP-080612-A | Selenium | Dissolved | 1.8 | 0.005 | | | 0 | |
| IA1-30A-080612 | SW | Vanadium | Total | 0.022 | 0.001 | | | DUP-080612-A | Vanadium | Total | 0.022 | 0.001 | | | 0 | |
| IA1-30A-080612 | SW | Vanadium | Dissolved | 0.022 | 0.001 | | | DUP-080612-A | Vanadium | Dissolved | 0.022 | 0.001 | | | 0 | |
| IA1-30A-080612 | SW | Zinc | Total | 0.018 | 0.005 | | | DUP-080612-A | Zinc | Total | 0.019 | 0.005 | | | -5 | |
| IA1-30A-080612 | SW | Zinc | Dissolved | 0.020 | 0.005 | | | DUP-080612-A | Zinc | Dissolved | 0.019 | 0.005 | | | 5 | |
| IA1-30A-080612 | SW | Total Hardness | Dissolved | 391 | 0.7 | | | DUP-080612-A | Total Hardness | Dissolved | 383 | 0.7 | | | 2 | |
| IA1-28A-090412 | SW | Cadmium | Total | 0.0015 | 0.00008 | | | DUP-090412-A | Cadmium | Total | 0.0014 | 0.00008 | | | 7 | |
| IA1-28A-090412 | SW | Cadmium | Dissolved | 0.00086 | 0.00008 | | | DUP-090412-A | Cadmium | Dissolved | 0.00083 | 0.00008 | | | 4 | |
| IA1-28A-090412 | SW | Calcium | Dissolved | 140 | 0.2 | | | DUP-090412-A | Calcium | Dissolved | 118 | 0.2 | | | 17 | |
| IA1-28A-090412 | SW | Chromium | Total | 0.0049 | 0.0005 | | | DUP-090412-A | Chromium | Total | 0.0051 | 0.0005 | | | -4 | |
| IA1-28A-090412 | SW | Chromium | Dissolved | 0.0049 | 0.0005 | | | DUP-090412-A | Chromium | Dissolved | 0.0047 | 0.0005 | | | 4 | |
| IA1-28A-090412 | SW | Magnesium | Dissolved | 27.2 | 0.025 | | | DUP-090412-A | Magnesium | Dissolved | 25.4 | 0.025 | | | 7 | |
| IA1-28A-090412 | SW | Nickel | Total | 0.016 | 0.0005 | | | DUP-090412-A | Nickel | Total | 0.015 | 0.0005 | | | 6 | |
| IA1-28A-090412 | SW | Nickel | Dissolved | 0.015 | 0.0005 | | | DUP-090412-A | Nickel | Dissolved | 0.014 | 0.0005 | | | 7 | |
| IA1-28A-090412 | SW | Selenium | Total | 2.0 | 0.0025 | | | DUP-090412-A | Selenium | Total | 1.9 | 0.0025 | | | 5 | |
| IA1-28A-090412 | SW | Selenium | Dissolved | 2.1 | 0.0025 | | | DUP-090412-A | Selenium | Dissolved | 2.0 | 0.0025 | | | 5 | |
| IA1-28A-090412 | SW | Vanadium | Total | 0.035 | 0.001 | | J+ | DUP-090412-A | Vanadium | Total | 0.034 | 0.001 | | J+ | 3 | |
| IA1-28A-090412 | SW | Vanadium | Dissolved | 0.036 | 0.001 | | J+ | DUP-090412-A | Vanadium | Dissolved | 0.034 | 0.001 | | J+ | 6 | |
| IA1-28A-090412 | SW | Zinc | Total | 0.048 | 0.005 | | J+ | DUP-090412-A | Zinc | Total | 0.046 | 0.005 | | J+ | 4 | |
| IA1-28A-090412 | SW | Zinc | Dissolved | 0.034 | 0.005 | | J+ | DUP-090412-A | Zinc | Dissolved | 0.032 | 0.005 | | J+ | 6 | |
| IA1-28A-090412 | SW | Total Hardness | Dissolved | 462 | 0.7 | | | DUP-090412-A | Total Hardness | Dissolved | 398 | 0.7 | | | 15 | |

## Table 2 Field Duplicate Results, Surface Water, 2012

| Sample Name | Media | Analyte | Fraction | Result (mg/L) | PQL | L | V | Duplicate Name | Analyte | Fraction | Result (mg/L) | PQL | L | V | RPD | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IA1-55-100112 | SW | Cadmium | Total | 0.0023 | 0.00008 | | | DUP-100112-A | Cadmium | Total | 0.0023 | 0.00008 | | | 0 | |
| IA1-55-100112 | SW | Cadmium | Dissolved | 0.0023 | 0.00008 | | | DUP-100112-A | Cadmium | Dissolved | 0.0022 | 0.00008 | | | 4 | |
| IA1-55-100112 | SW | Calcium | Dissolved | 206 | 0.4 | | | DUP-100112-A | Calcium | Dissolved | 200 | 0.4 | | | 3 | |
| IA1-55-100112 | SW | Chromium | Total | 0.0053 | 0.0005 | | | DUP-100112-A | Chromium | Total | 0.0052 | 0.0005 | | | 2 | |
| IA1-55-100112 | SW | Chromium | Dissolved | 0.0049 | 0.0005 | | | DUP-100112-A | Chromium | Dissolved | 0.0049 | 0.0005 | | | 0 | |
| IA1-55-100112 | SW | Magnesium | Dissolved | 28.3 | 0.025 | | | DUP-100112-A | Magnesium | Dissolved | 28.3 | 0.025 | | | 0 | |
| IA1-55-100112 | SW | Nickel | Total | 0.020 | 0.0005 | | | DUP-100112-A | Nickel | Total | 0.021 | 0.0005 | | | -5 | |
| IA1-55-100112 | SW | Nickel | Dissolved | 0.020 | 0.0005 | | | DUP-100112-A | Nickel | Dissolved | 0.019 | 0.0005 | | | 5 | |
| IA1-55-100112 | SW | Selenium | Total | 2.1 | 0.005 | | | DUP-100112-A | Selenium | Total | 2.0 | 0.0025 | | | 5 | |
| IA1-55-100112 | SW | Selenium | Dissolved | 2.1 | 0.0025 | | | DUP-100112-A | Selenium | Dissolved | 2.1 | 0.0025 | | | 0 | |
| IA1-55-100112 | SW | Vanadium | Total | 0.036 | 0.0001 | | | DUP-100112-A | Vanadium | Total | 0.036 | 0.0001 | | | 0 | |
| IA1-55-100112 | SW | Vanadium | Dissolved | 0.035 | 0.0001 | | | DUP-100112-A | Vanadium | Dissolved | 0.035 | 0.0001 | | | 0 | |
| IA1-55-100112 | SW | Zinc | Total | 0.085 | 0.005 | | | DUP-100112-A | Zinc | Total | 0.087 | 0.005 | | | -2 | |
| IA1-55-100112 | SW | Zinc | Dissolved | 0.097 | 0.025 | | | DUP-100112-A | Zinc | Dissolved | 0.083 | 0.025 | | | 16 | |
| IA1-55-100112 | SW | Total Hardness | Dissolved | 632 | 1.4 | | | DUP-100112-A | Total Hardness | Dissolved | 615 | 1.4 | | | 3 | |

NA = Not Applicable (ratio)
NC = Not Calculable
NR = Not Reported
L = Laboratory qualifier
V = Validation qualifier

# LABORATORY REPORTS

# DATA VALIDATION REPORT

| | |
|---|---|
| Company: | AECOM Environment |
| Project Name: | Agrium, Inc. |
| Laboratory: | Pace Analytical Services, Inc. |
| Pace Project ID: | 10191224 |
| Data Validator: | Chris Davis |
| Date Validated: | December 5, 2012 |
| Reviewer: | Julie Lincoln |
| Date Reviewed: | December 7, 2012 |
| Sample Media: | Surface Water |
| Analytical Parameters and Methods: | 1. Total and Dissolved Metals (cadmium, chromium, nickel, selenium, vanadium, and zinc); 200.8<br>2. Dissolved Cations (calcium, magnesium); 200.8<br>3. Hardness; SM2340B |
| Sample Identifications: | IA1-55-050212<br>IA1-28A-050212<br>IA1-30A-050212<br>Dup-050212-A (field duplicate for IA1-30A-050212) |

## 1. PRESERVATION AND HOLDING TIMES

Preservation: Acceptable.

Holding Time: Acceptable.

## 2. BLANKS

Non-detected, except laboratory reagent blanks (LRBs) or continuing calibration blanks (CCBs) at the following maximum concentrations in the specified batches for:

Dissolved calcium at 0.0020 mg/L (LRB MPRP/32308)

Dissolved magnesium at 0.00050 mg/L (LRB MPRP/32308)

Dissolved hardness at 0.071 mg/L (LRB MPRP/32308)

Dissolved and total vanadium at 0.000086 mg/L (CCBs)

total cadmium at 0.000036 mg/L (CCBs)

**Qualification:** No qualification was necessary. All sample results were greater than 10-times the concentrations in the associated blanks.

## 3. LABORATORY CONTROL SAMPLES

Acceptable.

## 4. DUPLICATE ANALYSES

Acceptable.

## 5. SPIKE SAMPLE ANALYSES

Acceptable. Note that the percent recovery (%R) of 63% for the matrix spike (MS) analysis of dissolved selenium in sample IA1-28A-050212 (10191224-002) exceeded the 75-125%R control limits for metals. For sample results that exceed four-times the concentration of the spike, spike recovery limits do not apply and the data are not considered to exceed acceptance criteria, even if the %Rs do not meet the specified control limits, as specified in the Functional Guidelines. As the sample result exceeded four times the spike, no qualifiers are applicable.

## 6. OVERALL ASSESSMENT

No other issues were identified.

NOTE: THE FOLOWING LABORATORY DATA REPORT (10191224) IS LEVEL 3 FORMAT. THE LEVEL 4 REPORT IS INCLUDED AS AN ELECTRONIC VERSION ON THE DISK IN THE BACK OF THE BINDER.

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May 30, 2012

Mitchell Hart
Nu-West Industries, Inc
3010 Conda Road
Soda Springs, ID 83276

RE: Project: Revised: North Maybe Mine
Pace Project No.: 10191224

Dear Mitchell Hart:
Enclosed are the analytical results for sample(s) received by the laboratory on May 04, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Revised: This report was revised on 5/30/12 to change the reportable units to mg/l per client request.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Cindy Emmons, Norwest Corporation
James Williams, Agrium

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## CERTIFICATIONS

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

**Minnesota Certification IDs**
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

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## SAMPLE SUMMARY

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| **10191224001** | **IA1-55-050212** | Water | 05/02/12 14:45 | 05/04/12 09:50 |
| **10191224002** | **IA1-28A-050212** | Water | 05/02/12 14:25 | 05/04/12 09:50 |
| **10191224003** | **IA1-30A-050212** | Water | 05/02/12 14:05 | 05/04/12 09:50 |
| **10191224004** | **Dup-050212-A** | Water | 05/02/12 13:30 | 05/04/12 09:50 |

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## SAMPLE ANALYTE COUNT

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| 10191224001 | IA1-55-050212 | EPA 200.8 | RR1 | 6 | PASI-M |
| | | EPA 200.8 | RR1 | 9 | PASI-M |
| 10191224002 | IA1-28A-050212 | EPA 200.8 | RR1 | 6 | PASI-M |
| | | EPA 200.8 | RR1 | 9 | PASI-M |
| 10191224003 | IA1-30A-050212 | EPA 200.8 | RR1 | 6 | PASI-M |
| | | EPA 200.8 | RR1 | 9 | PASI-M |
| 10191224004 | Dup-050212-A | EPA 200.8 | RR1 | 6 | PASI-M |
| | | EPA 200.8 | RR1 | 9 | PASI-M |

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## PROJECT NARRATIVE

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

**Method:** EPA 200.8
**Description:** 200.8 MET ICPMS
**Client:** Agrium- Nu-West
**Date:** May 30, 2012

**General Information:**
4 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

**Method:** **EPA 200.8**
**Description:** 200.8 MET ICPMS, Dissolved
**Client:** Agrium- Nu-West
**Date:** May 30, 2012

**General Information:**
4 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

V: Indicates that the analyte was detected in both the sample and the associated method blank.
- Dup-050212-A (Lab ID: 10191224004)
- IA1-28A-050212 (Lab ID: 10191224002)
- IA1-30A-050212 (Lab ID: 10191224003)
- IA1-55-050212 (Lab ID: 10191224001)

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/32308

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10190611001,10191224002

J(M1): Estimated Value. Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- MS (Lab ID: 1192482)
  - Calcium, Dissolved
- MSD (Lab ID: 1192483)
  - Calcium, Dissolved

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- MS (Lab ID: 1192484)
  - Selenium, Dissolved

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## PROJECT NARRATIVE

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

**Method:** EPA 200.8
**Description:** 200.8 MET ICPMS, Dissolved
**Client:** Agrium- Nu-West
**Date:** May 30, 2012

**Duplicate Sample:**
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: MPRP/32308

V: Indicates that the analyte was detected in both the sample and the associated method blank.

- Dup-050212-A (Lab ID: 10191224004)
  - Calcium, Dissolved
  - Magnesium, Dissolved
- IA1-28A-050212 (Lab ID: 10191224002)
  - Calcium, Dissolved
  - Magnesium, Dissolved
- IA1-30A-050212 (Lab ID: 10191224003)
  - Calcium, Dissolved
  - Magnesium, Dissolved
- IA1-55-050212 (Lab ID: 10191224001)
  - Calcium, Dissolved
  - Magnesium, Dissolved

This data package has been reviewed for quality and completeness and is approved for release.

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## ANALYTICAL RESULTS

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

**Sample: IA1-55-050212** **Lab ID: 10191224001** Collected: 05/02/12 14:45 Received: 05/04/12 09:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0016** | mg/L | 0.000080 | 0.000028 | 1 | 05/15/12 17:38 | 05/17/12 22:50 | 7440-43-9 | |
| Chromium | **0.018** | mg/L | 0.00050 | 0.000094 | 1 | 05/15/12 17:38 | 05/17/12 22:50 | 7440-47-3 | |
| Nickel | **0.015** | mg/L | 0.00050 | 0.000091 | 1 | 05/15/12 17:38 | 05/17/12 22:50 | 7440-02-0 | |
| Selenium | **2.4** | mg/L | 0.0050 | 0.0022 | 10 | 05/15/12 17:38 | 05/19/12 11:28 | 7782-49-2 | |
| Vanadium | **0.050** | mg/L | 0.00010 | 0.000027 | 1 | 05/15/12 17:38 | 05/17/12 22:50 | 7440-62-2 | |
| Zinc | **0.067** | mg/L | 0.0050 | 0.0025 | 1 | 05/15/12 17:38 | 05/17/12 22:50 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0016** | mg/L | 0.000080 | 0.000028 | 1 | 05/14/12 13:16 | 05/16/12 21:59 | 7440-43-9 | |
| Calcium, Dissolved | **83.2** | mg/L | 0.10 | 0.042 | 5 | 05/14/12 13:16 | 05/16/12 22:02 | 7440-70-2 | V |
| Chromium, Dissolved | **0.018** | mg/L | 0.00050 | 0.000094 | 1 | 05/14/12 13:16 | 05/16/12 21:59 | 7440-47-3 | |
| Magnesium, Dissolved | **19.5** | mg/L | 0.0050 | 0.0019 | 1 | 05/14/12 13:16 | 05/16/12 21:59 | 7439-95-4 | V |
| Nickel, Dissolved | **0.015** | mg/L | 0.00050 | 0.000091 | 1 | 05/14/12 13:16 | 05/16/12 21:59 | 7440-02-0 | |
| Selenium, Dissolved | **2.3** | mg/L | 0.025 | 0.011 | 50 | 05/14/12 13:16 | 05/16/12 22:06 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **288** | mg/L | 0.36 | 0.18 | 5 | 05/14/12 13:16 | 05/16/12 22:02 | | |
| Vanadium, Dissolved | **0.051** | mg/L | 0.00010 | 0.000027 | 1 | 05/14/12 13:16 | 05/16/12 21:59 | 7440-62-2 | |
| Zinc, Dissolved | **0.066** | mg/L | 0.0050 | 0.0025 | 1 | 05/14/12 13:16 | 05/16/12 21:59 | 7440-66-6 | |

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## ANALYTICAL RESULTS

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

**Sample: IA1-28A-050212** **Lab ID: 10191224002** Collected: 05/02/12 14:25 Received: 05/04/12 09:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0016** | mg/L | 0.000080 | 0.000028 | 1 | 05/15/12 17:38 | 05/17/12 22:57 | 7440-43-9 | |
| Chromium | **0.016** | mg/L | 0.00050 | 0.000094 | 1 | 05/15/12 17:38 | 05/17/12 22:57 | 7440-47-3 | |
| Nickel | **0.014** | mg/L | 0.00050 | 0.000091 | 1 | 05/15/12 17:38 | 05/17/12 22:57 | 7440-02-0 | |
| Selenium | **2.2** | mg/L | 0.0050 | 0.0022 | 10 | 05/15/12 17:38 | 05/19/12 11:32 | 7782-49-2 | |
| Vanadium | **0.048** | mg/L | 0.00010 | 0.000027 | 1 | 05/15/12 17:38 | 05/17/12 22:57 | 7440-62-2 | |
| Zinc | **0.059** | mg/L | 0.0050 | 0.0025 | 1 | 05/15/12 17:38 | 05/17/12 22:57 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0015** | mg/L | 0.000080 | 0.000028 | 1 | 05/14/12 13:16 | 05/16/12 22:09 | 7440-43-9 | |
| Calcium, Dissolved | **81.7** | mg/L | 0.10 | 0.042 | 5 | 05/14/12 13:16 | 05/16/12 22:12 | 7440-70-2 | V |
| Chromium, Dissolved | **0.017** | mg/L | 0.00050 | 0.000094 | 1 | 05/14/12 13:16 | 05/16/12 22:09 | 7440-47-3 | |
| Magnesium, Dissolved | **19.2** | mg/L | 0.0050 | 0.0019 | 1 | 05/14/12 13:16 | 05/16/12 22:09 | 7439-95-4 | V |
| Nickel, Dissolved | **0.014** | mg/L | 0.00050 | 0.000091 | 1 | 05/14/12 13:16 | 05/16/12 22:09 | 7440-02-0 | |
| Selenium, Dissolved | **2.2** | mg/L | 0.0025 | 0.0011 | 5 | 05/14/12 13:16 | 05/16/12 22:12 | 7782-49-2 | M6 |
| Total Hardness by 2340B, Dissolved | **283** | mg/L | 0.36 | 0.18 | 5 | 05/14/12 13:16 | 05/16/12 22:12 | | |
| Vanadium, Dissolved | **0.051** | mg/L | 0.00010 | 0.000027 | 1 | 05/14/12 13:16 | 05/16/12 22:09 | 7440-62-2 | |
| Zinc, Dissolved | **0.062** | mg/L | 0.0050 | 0.0025 | 1 | 05/14/12 13:16 | 05/16/12 22:09 | 7440-66-6 | |

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## ANALYTICAL RESULTS

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

**Sample: IA1-30A-050212** **Lab ID: 10191224003** Collected: 05/02/12 14:05 Received: 05/04/12 09:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0015** | mg/L | 0.000080 | 0.000028 | 1 | 05/15/12 17:38 | 05/17/12 23:04 | 7440-43-9 | |
| Chromium | **0.017** | mg/L | 0.00050 | 0.000094 | 1 | 05/15/12 17:38 | 05/17/12 23:04 | 7440-47-3 | |
| Nickel | **0.014** | mg/L | 0.00050 | 0.000091 | 1 | 05/15/12 17:38 | 05/17/12 23:04 | 7440-02-0 | |
| Selenium | **2.3** | mg/L | 0.0050 | 0.0022 | 10 | 05/15/12 17:38 | 05/19/12 11:35 | 7782-49-2 | |
| Vanadium | **0.049** | mg/L | 0.00010 | 0.000027 | 1 | 05/15/12 17:38 | 05/17/12 23:04 | 7440-62-2 | |
| Zinc | **0.058** | mg/L | 0.0050 | 0.0025 | 1 | 05/15/12 17:38 | 05/17/12 23:04 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0014** | mg/L | 0.000080 | 0.000028 | 1 | 05/14/12 13:16 | 05/16/12 22:40 | 7440-43-9 | |
| Calcium, Dissolved | **82.6** | mg/L | 0.10 | 0.042 | 5 | 05/14/12 13:16 | 05/16/12 22:43 | 7440-70-2 | V |
| Chromium, Dissolved | **0.017** | mg/L | 0.00050 | 0.000094 | 1 | 05/14/12 13:16 | 05/16/12 22:40 | 7440-47-3 | |
| Magnesium, Dissolved | **19.7** | mg/L | 0.0050 | 0.0019 | 1 | 05/14/12 13:16 | 05/16/12 22:40 | 7439-95-4 | V |
| Nickel, Dissolved | **0.013** | mg/L | 0.00050 | 0.000091 | 1 | 05/14/12 13:16 | 05/16/12 22:40 | 7440-02-0 | |
| Selenium, Dissolved | **2.2** | mg/L | 0.0025 | 0.0011 | 5 | 05/14/12 13:16 | 05/16/12 22:43 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **288** | mg/L | 0.36 | 0.18 | 5 | 05/14/12 13:16 | 05/16/12 22:43 | | |
| Vanadium, Dissolved | **0.049** | mg/L | 0.00010 | 0.000027 | 1 | 05/14/12 13:16 | 05/16/12 22:40 | 7440-62-2 | |
| Zinc, Dissolved | **0.057** | mg/L | 0.0050 | 0.0025 | 1 | 05/14/12 13:16 | 05/16/12 22:40 | 7440-66-6 | |



**REPORT OF LABORATORY ANALYSIS**

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## ANALYTICAL RESULTS

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

**Sample: Dup-050212-A** **Lab ID: 10191224004** Collected: 05/02/12 13:30 Received: 05/04/12 09:50 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0014** | mg/L | 0.000080 | 0.000028 | 1 | 05/15/12 17:38 | 05/17/12 23:10 | 7440-43-9 | |
| Chromium | **0.016** | mg/L | 0.00050 | 0.000094 | 1 | 05/15/12 17:38 | 05/17/12 23:10 | 7440-47-3 | |
| Nickel | **0.013** | mg/L | 0.00050 | 0.000091 | 1 | 05/15/12 17:38 | 05/17/12 23:10 | 7440-02-0 | |
| Selenium | **2.2** | mg/L | 0.0025 | 0.0011 | 5 | 05/15/12 17:38 | 05/17/12 23:14 | 7782-49-2 | |
| Vanadium | **0.047** | mg/L | 0.00010 | 0.000027 | 1 | 05/15/12 17:38 | 05/17/12 23:10 | 7440-62-2 | |
| Zinc | **0.056** | mg/L | 0.0050 | 0.0025 | 1 | 05/15/12 17:38 | 05/17/12 23:10 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0014** | mg/L | 0.000080 | 0.000028 | 1 | 05/14/12 13:16 | 05/16/12 22:50 | 7440-43-9 | |
| Calcium, Dissolved | **83.6** | mg/L | 0.10 | 0.042 | 5 | 05/14/12 13:16 | 05/16/12 22:53 | 7440-70-2 | V |
| Chromium, Dissolved | **0.017** | mg/L | 0.00050 | 0.000094 | 1 | 05/14/12 13:16 | 05/16/12 22:50 | 7440-47-3 | |
| Magnesium, Dissolved | **19.5** | mg/L | 0.0050 | 0.0019 | 1 | 05/14/12 13:16 | 05/16/12 22:50 | 7439-95-4 | V |
| Nickel, Dissolved | **0.013** | mg/L | 0.00050 | 0.000091 | 1 | 05/14/12 13:16 | 05/16/12 22:50 | 7440-02-0 | |
| Selenium, Dissolved | **2.2** | mg/L | 0.0025 | 0.0011 | 5 | 05/14/12 13:16 | 05/16/12 22:53 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **289** | mg/L | 0.36 | 0.18 | 5 | 05/14/12 13:16 | 05/16/12 22:53 | | |
| Vanadium, Dissolved | **0.048** | mg/L | 0.00010 | 0.000027 | 1 | 05/14/12 13:16 | 05/16/12 22:50 | 7440-62-2 | |
| Zinc, Dissolved | **0.056** | mg/L | 0.0050 | 0.0025 | 1 | 05/14/12 13:16 | 05/16/12 22:50 | 7440-66-6 | |

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## QUALITY CONTROL DATA

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

QC Batch: MPRP/32309 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10191224001, 10191224002, 10191224003, 10191224004

METHOD BLANK: 1192495 Matrix: Water
Associated Lab Samples: 10191224001, 10191224002, 10191224003, 10191224004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Cadmium | mg/L | <0.000028 | 0.000080 | 05/17/12 23:51 | |
| Chromium | mg/L | <0.000094 | 0.00050 | 05/17/12 23:51 | |
| Nickel | mg/L | <0.000091 | 0.00050 | 05/17/12 23:51 | |
| Selenium | mg/L | <0.00022 | 0.00050 | 05/17/12 23:51 | |
| Vanadium | mg/L | <0.000027 | 0.00010 | 05/17/12 23:51 | |
| Zinc | mg/L | <0.0025 | 0.0050 | 05/17/12 23:51 | |

LABORATORY CONTROL SAMPLE: 1192496

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Cadmium | mg/L | .08 | 0.080 | 100 | 85-115 | |
| Chromium | mg/L | .08 | 0.080 | 100 | 85-115 | |
| Nickel | mg/L | .08 | 0.080 | 100 | 85-115 | |
| Selenium | mg/L | .08 | 0.082 | 102 | 85-115 | |
| Vanadium | mg/L | .08 | 0.080 | 100 | 85-115 | |
| Zinc | mg/L | .08 | 0.084 | 105 | 85-115 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1192497 1192498

| Parameter | Units | 10191087001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cadmium | mg/L | 0.00031 | .08 | .08 | 0.077 | 0.076 | 96 | 95 | 70-130 | 1 | 20 | |
| Chromium | mg/L | 0.0013 | .08 | .08 | 0.079 | 0.080 | 97 | 99 | 70-130 | 2 | 20 | |
| Nickel | mg/L | 0.0082 | .08 | .08 | 0.086 | 0.086 | 97 | 97 | 70-130 | .5 | 20 | |
| Selenium | mg/L | 0.027 | .08 | .08 | 0.11 | 0.11 | 98 | 101 | 70-130 | 2 | 20 | |
| Vanadium | mg/L | 1.2 ug/L | .08 | .08 | 0.080 | 0.079 | 98 | 98 | 70-130 | .7 | 20 | |
| Zinc | mg/L | 0.043 | .08 | .08 | 0.12 | 0.12 | 100 | 96 | 70-130 | 2 | 20 | |

MATRIX SPIKE SAMPLE: 1192499

| Parameter | Units | 92117868003 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Cadmium | mg/L | | .08 | 0.073 | 91 | 70-130 | |
| Chromium | mg/L | | .08 | 0.076 | 94 | 70-130 | |
| Nickel | mg/L | | .08 | 0.073 | 91 | 70-130 | |
| Selenium | mg/L | | .08 | 0.077 | 96 | 70-130 | |
| Vanadium | mg/L | | .08 | 0.076 | 94 | 70-130 | |
| Zinc | mg/L | | .08 | 0.080 | 98 | 70-130 | |

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## QUALITY CONTROL DATA

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

QC Batch: MPRP/32308 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10191224001, 10191224002, 10191224003, 10191224004

METHOD BLANK: 1192480 Matrix: Water
Associated Lab Samples: 10191224001, 10191224002, 10191224003, 10191224004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | <0.000028 | 0.000080 | 05/16/12 17:33 | |
| Calcium, Dissolved | mg/L | 0.011 I | 0.020 | 05/16/12 17:33 | |
| Chromium, Dissolved | mg/L | <0.000094 | 0.00050 | 05/16/12 17:33 | |
| Magnesium, Dissolved | mg/L | 0.0030 I | 0.0050 | 05/16/12 17:33 | |
| Nickel, Dissolved | mg/L | <0.000091 | 0.00050 | 05/16/12 17:33 | |
| Selenium, Dissolved | mg/L | <0.00022 | 0.00050 | 05/16/12 17:33 | |
| Total Hardness by 2340B, Dissolved | mg/L | 0.040 I | 0.071 | 05/16/12 17:33 | |
| Vanadium, Dissolved | mg/L | <0.000027 | 0.00010 | 05/16/12 17:33 | |
| Zinc, Dissolved | mg/L | <0.0025 | 0.0050 | 05/16/12 17:33 | |

LABORATORY CONTROL SAMPLE: 1192481

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | .08 | 0.081 | 101 | 85-115 | |
| Calcium, Dissolved | mg/L | 1 | 1.1 | 108 | 85-115 | |
| Chromium, Dissolved | mg/L | .08 | 0.084 | 105 | 85-115 | |
| Magnesium, Dissolved | mg/L | 1 | 1.1 | 105 | 85-115 | |
| Nickel, Dissolved | mg/L | .08 | 0.086 | 108 | 85-115 | |
| Selenium, Dissolved | mg/L | .08 | 0.078 | 97 | 85-115 | |
| Total Hardness by 2340B, Dissolved | mg/L | 6.6 | 7.0 | 107 | 85-115 | |
| Vanadium, Dissolved | mg/L | .08 | 0.084 | 105 | 85-115 | |
| Zinc, Dissolved | mg/L | .08 | 0.082 | 103 | 85-115 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1192482 1192483

| Parameter | Units | 10190611001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | | .08 | .08 | 0.079 | 0.078 | 99 | 97 | 70-130 | 2 | 20 | |
| Calcium, Dissolved | mg/L | 92400 ug/L | 1 | 1 | 89.6 | 91.9 | -275 | -50 | 70-130 | 2 | 20 | J(M1) |
| Chromium, Dissolved | mg/L | 0.56 ug/L | .08 | .08 | 0.082 | 0.082 | 102 | 101 | 70-130 | .4 | 20 | |
| Magnesium, Dissolved | mg/L | 3100 ug/L | 1 | 1 | 4.0 | 4.1 | 91 | 101 | 70-130 | 2 | 20 | |
| Nickel, Dissolved | mg/L | | .08 | .08 | 0.085 | 0.084 | 106 | 105 | 70-130 | .4 | 20 | |
| Selenium, Dissolved | mg/L | <0.50 ug/L | .08 | .08 | 0.077 | 0.076 | 95 | 95 | 70-130 | .3 | 20 | |
| Total Hardness by 2340B, Dissolved | mg/L | | 6.6 | 6.6 | 240 | 246 | -47 | 44 | 70-130 | 2 | 20 | |
| Vanadium, Dissolved | mg/L | | .08 | .08 | 0.083 | 0.083 | 103 | 103 | 70-130 | .2 | 20 | |

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## QUALITY CONTROL DATA

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1192482 1192483

| Parameter | Units | 10190611001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Zinc, Dissolved | mg/L | | .08 | .08 | 0.091 | 0.090 | 99 | 97 | 70-130 | 2 | 20 | |

MATRIX SPIKE SAMPLE: 1192484

| Parameter | Units | 10191224002 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | 0.0015 | .08 | 0.080 | 98 | 70-130 | |
| Calcium, Dissolved | mg/L | 81.7 | 1 | 82.8 | 115 | 70-130 | |
| Chromium, Dissolved | mg/L | 0.017 | .08 | 0.097 | 100 | 70-130 | |
| Magnesium, Dissolved | mg/L | 19.2 | 1 | 20.2 | 92 | 70-130 | |
| Nickel, Dissolved | mg/L | 0.014 | .08 | 0.090 | 95 | 70-130 | |
| Selenium, Dissolved | mg/L | 2.2 | .08 | 2.2 | 63 | 70-130 | M6 |
| Total Hardness by 2340B, Dissolved | mg/L | 283 | 6.6 | 290 | 101 | 70-130 | |
| Vanadium, Dissolved | mg/L | 0.051 | .08 | 0.13 | 100 | 70-130 | |
| Zinc, Dissolved | mg/L | 0.062 | .08 | 0.14 | 101 | 70-130 | |

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## QUALIFIERS

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

**DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

**LABORATORIES**

| | |
|---|---|
| PASI-M | Pace Analytical Services - Minneapolis |

**ANALYTE QUALIFIERS**

| | |
|---|---|
| I | The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit. |
| J(M1) | Estimated Value. Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery. |
| M6 | Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution. |
| V | Indicates that the analyte was detected in both the sample and the associated method blank. |

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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Revised: North Maybe Mine
Pace Project No.: 10191224

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **10191224001** | **IA1-55-050212** | EPA 200.8 | MPRP/32309 | EPA 200.8 | ICPM/12810 |
| **10191224002** | **IA1-28A-050212** | EPA 200.8 | MPRP/32309 | EPA 200.8 | ICPM/12810 |
| **10191224003** | **IA1-30A-050212** | EPA 200.8 | MPRP/32309 | EPA 200.8 | ICPM/12810 |
| **10191224004** | **Dup-050212-A** | EPA 200.8 | MPRP/32309 | EPA 200.8 | ICPM/12810 |
| **10191224001** | **IA1-55-050212** | EPA 200.8 | MPRP/32308 | EPA 200.8 | ICPM/12796 |
| **10191224002** | **IA1-28A-050212** | EPA 200.8 | MPRP/32308 | EPA 200.8 | ICPM/12796 |
| **10191224003** | **IA1-30A-050212** | EPA 200.8 | MPRP/32308 | EPA 200.8 | ICPM/12796 |
| **10191224004** | **Dup-050212-A** | EPA 200.8 | MPRP/32308 | EPA 200.8 | ICPM/12796 |

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10191224

Page: 1 of 1

| Section A Required Client Information: | | Section B Required Project Information: | | Section C Invoice Information: | |
|---|---|---|---|---|---|
| Company: | Agrium/Nu-West | Report To: | James.Williams@agrium.com | Attention: | Accounts Payable |
| Address: | 3010 Conda Rd | Copy To: | Julie.Lincoln@aecom.com | Company Name: | Nu-West Industries, Inc. |
| | Soda Springs, ID. 83276 | | | Address: | Calgary, Alberta, Canada T2H 3B9 |
| Email To: | Mitchell.Hart@agrium.com | Purchase Order No.: | 4800058265 | Pace Quote Reference: | Nor_040612_NMM SW |
| Phone: | 208-547-3935 Fax: | Project Name: | North Maybe Mine | Pace Project Manager: | Sally Heinje |
| Requested Due Date/TAT: | 7-10 Business Days | Project Number: | | Pace Profile #: | |

**REGULATORY AGENCY**

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: ID

**Requested Analysis Filtered (Y/N)**

| ITEM # | Section D Required Client Information — SAMPLE ID (A-Z, 0-9 / , -) Sample IDs MUST BE UNIQUE | Valid Matrix Codes: MATRIX / CODE — DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED: COMPOSITE START DATE | COMPOSITE START TIME | COMPOSITE END/GRAB DATE | COMPOSITE END/GRAB TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Y/N | Analysis Test: Table 4-1 (enclosed) | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | IAI-55-050212 | WT | G | 05/02/12 | | 1445 | | | 2 | | ✓ | | | | | | | | X | | 001 |
| 2 | IAI-28A-050212 | WT | G | 05/02/12 | | 1425 | | | 2 | | ✓ | | | | | | | | X | | 002 |
| 3 | IAI-30A-050212 | WT | G | 05/02/12 | | 1405 | | | 2 | | ✓ | | | | | | | | X | | 003 |
| 4 | DUP-050212-A | WT | G | 05/02/12 | | 1330 | | | 2 | | ✓ | | | | | | | | X | | 004 |
| 5 | | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS: Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N) |
|---|---|---|---|---|---|---|---|---|---|---|
| cooler id # 104916 | James B. Williams | 05/03/12 | 0800 | J Richardson Pace MN | 5/4/12 | 09:50 | 0.4 | Y | Y | Y |
| Level IV data package | | | | | | | | | | |
| 110 of 119 | | | | | | | | | | |

**SAMPLER NAME AND SIGNATURE**

PRINT Name of SAMPLER: James B. Williams

SIGNATURE of SAMPLER: James B. Williams — DATE Signed (MM/DD/YY): 05/02/12

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

## Table 4-1 Surface water Analyte List for April, May, June, August, September and October

| Analyte | Analytical Method | Container Size | | Container Material | Preservative | Holding Time | Detection Limit/Units |
|---|---|---|---|---|---|---|---|
| | | Total | Dissolved | | | | |
| Cadmium – total & dissolved* | EPA M200.8 | 250 ml | 250 ml* | Polyethylene | Nitric Acid | 180 Days | 0.1 µg/L |
| Chromium – total & dissolved* | EPA M200.8 | | | | | | 0.1 µg/L |
| Nickel – total & dissolved* | EPA M200.8 | | | | | | 0.6 µg/L |
| Selenium – total & dissolved* | EPA M200.8 | | | | | | 0.1 µg/L |
| Vanadium – total & dissolved* | EPA M200.8 | | | | | | 0.2 µg/L |
| Zinc – total & dissolved* | EPA M200.8 | | | | | | 2 µg/L |
| Hardness | EPA SM2340B (Calculated) | - | | Polyethylene | Nitric Acid | 180 Days | 2 mg/L |
| pH | Field | - | - | - | - | Analyze immediately | standard units |
| ORP | Field | - | - | - | - | | mV |
| Dissolved Oxygen | Field | - | - | - | - | | mg/L |
| Conductivity | Field | - | - | - | - | | µmhos/cm |
| Temperature | Field | - | - | - | - | | °C |
| Turbidity | Field | - | - | - | - | | NTU |

* Sample for dissolved analysis will be field filtered using a disposable 0.45 micron filter prior to preservation
ml = milliliters
µg/L = micrograms per liter
mg/L = milligrams per liter
mV = millivolts
µmhos/cm = micromhos per centimeter
°C = degrees Celsius
NTU = nephelometric turbidity units

| Pace Analytical | Document Name: Sample Condition Upon Receipt Form | Revised Date: 15Feb2012 Page 1 of 1 |
|---|---|---|
| | Document Number: F-MN-L-213-rev.02 | Issuing Authority: Pace Minnesota Quality Office |

**Sample Condition Upon Receipt**

Client Name: Agrium/Nu-West Project # 10191224

**Courier:** ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

**Tracking #:** 8992 6652 2027

**Custody Seal on Cooler/Box Present:** ☒ yes ☐ no Seals intact: ☒ yes ☐ no

[redacted]

**Packing Material:** ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☒ Other _____ Temp Blank: Yes ☒ No ☐

**Thermometer Used** 80344042 or 80512447 **Type of Ice:** Wet Blue None ☐ Samples on ice, cooling process has begun

**Cooler Temperature** 0.4° **Biological Tissue is Frozen:** Yes No

Temp should be above freezing to 6°C

**Date and initials of person examining contents:** JL 5-4-12

| | | Comments: |
|---|---|---|
| Chain of Custody Present: | ☑Yes ☐No ☐N/A | 1. |
| Chain of Custody Filled Out: | ☑Yes ☐No ☐N/A | 2. |
| Chain of Custody Relinquished: | ☑Yes ☐No ☐N/A | 3. |
| Sampler Name & Signature on COC: | ☑Yes ☐No ☐N/A | 4. |
| Samples Arrived within Hold Time: | ☑Yes ☐No ☐N/A | 5. |
| **Short Hold Time Analysis (<72hr):** | ☐Yes ☑No ☐N/A | 6. |
| **Rush Turn Around Time Requested:** | ☐Yes ☑No ☐N/A | 7. |
| Sufficient Volume: | ☑Yes ☐No ☐N/A | 8. |
| Correct Containers Used: | ☑Yes ☐No ☐N/A | 9. |
| -Pace Containers Used: | ☑Yes ☐No ☐N/A | |
| Containers Intact: | ☑Yes ☐No ☐N/A | 10. |
| Filtered volume received for Dissolved tests | ☐Yes ☐No ☑N/A | 11. |
| Sample Labels match COC: | ☑Yes ☐No ☐N/A | 12. |
| -Includes date/time/ID/Analysis Matrix: WT | | |
| All containers needing acid/base preservation have been checked. Noncompliance are noted in 13. | ☑Yes ☐No ☐N/A | 13. ☒ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl Samp # IA1-55-050212 2/2, IA1-28A-050212 2/2 IA1-30A-050212 2/2, DUP 050212-A 2/2 |
| All containers needing preservation are found to be in compliance with EPA recommendation. (HNO3, H2SO4, HCL<2; NaOH >12) | ☑Yes ☐No ☐N/A | |
| Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water) | ☐Yes ☑No | Initial when completed JL / Lot # of added preservative |
| Headspace in VOA Vials ( >6mm): | ☐Yes ☐No ☑N/A | 14. |
| Trip Blank Present: | ☐Yes ☑No ☐N/A | 15. |
| Trip Blank Custody Seals Present | ☐Yes ☐No ☑N/A | |
| Pace Trip Blank Lot # (if purchased): | | |

**Client Notification/ Resolution:** Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

**Project Manager Review:** _____ **Date:** _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers)

# DATA VALIDATION REPORT

| | |
|---|---|
| Company: | AECOM Environment |
| Project Name: | Agrium, Inc. |
| Laboratory: | Pace Analytical Services, Inc. |
| Pace Project ID: | 10194527 |
| Data Validator: | Chris Davis |
| Date Validated: | December 5, 2012 |
| Reviewer: | Julie Lincoln |
| Date Reviewed: | December 7, 2012 |
| Sample Media: | Surface Water |
| Analytical Parameters and Methods: | 1. Total and Dissolved Metals (cadmium, chromium, nickel, selenium, vanadium, and zinc); 200.8<br>2. Dissolved Cations (calcium, magnesium); 200.8<br>3. Hardness; SM2340B |
| Sample Identifications: | IA1-30A-060512<br>IA1-28A-060512<br>IA1-55-060512<br>DUP-060512-A (field duplicate for IA1-28A-060512) |

## 1. PRESERVATION AND HOLDING TIMES

Preservation: Acceptable.

Holding Time: Acceptable.

## 2. BLANKS

Non-detected for all laboratory reagent blanks (LRBs).

**Qualification:** No qualification was necessary.

## 3. LABORATORY CONTROL SAMPLES

Acceptable.

## 4. DUPLICATE ANALYSES

Acceptable.

## 5. SPIKE SAMPLE ANALYSES

Acceptable. Note that the percent recoveries (%Rs) of 145% and 490% for dissolved calcium in the matrix spike (MS)/matrix spike duplicate (MSD), -2% for dissolved selenium in the MS, and 152% in the MS analyses of sample IA1-30A-060512 (10194527-001) exceeded the 75-125%R control limits for metals. For sample results that exceed four-times the concentration of the spike, spike recovery limits do not apply and the data are not considered to exceed acceptance criteria, even if the %Rs do not meet the specified control limits, as specified in the Functional Guidelines. As the sample results exceeded four times the spike, no qualifiers are applicable.

## 6. OVERALL ASSESSMENT

No other issues were identified.

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July 03, 2012

Mitchell Hart
Nu-West Industries, Inc
3010 Conda Road
Soda Springs, ID 83276

RE: Project: North Maybe Mine
Pace Project No.: 10194527

Dear Mitchell Hart:
Enclosed are the analytical results for sample(s) received by the laboratory on June 07, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Cindy Emmons, Norwest Corporation
James Williams, Agrium

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## CERTIFICATIONS

Project: North Maybe Mine
Pace Project No.: 10194527

**Minnesota Certification IDs**
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

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## SAMPLE SUMMARY

Project: North Maybe Mine
Pace Project No.: 10194527

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| **10194527001** | **IA1-30A-060512** | Water | 06/05/12 13:05 | 06/07/12 10:10 |
| **10194527002** | **IA1-28A-060512** | Water | 06/05/12 13:20 | 06/07/12 10:10 |
| **10194527003** | **IA1-55-060512** | Water | 06/05/12 13:40 | 06/07/12 10:10 |
| **10194527004** | **DUP-060512-A** | Water | 06/05/12 12:45 | 06/07/12 10:10 |

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## SAMPLE ANALYTE COUNT

Project: North Maybe Mine
Pace Project No.: 10194527

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| 10194527001 | IA1-30A-060512 | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |
| 10194527002 | IA1-28A-060512 | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |
| 10194527003 | IA1-55-060512 | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |
| 10194527004 | DUP-060512-A | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10194527

**Method:** EPA 200.8
**Description:** 200.8 MET ICPMS
**Client:** Agrium- Nu-West
**Date:** July 03, 2012

**General Information:**
4 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

B: Analyte was detected in the associated method blank.
- IA1-30A-060512 (Lab ID: 10194527001)

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/32866

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10194527001,10194550007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- MS (Lab ID: 1213277)
  - Selenium

**Duplicate Sample:**
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10194527

**Method:** **EPA 200.8**
**Description:** 200.8 MET ICPMS
**Client:** Agrium- Nu-West
**Date:** July 03, 2012

Analyte Comments:

QC Batch: MPRP/32866

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1213277)
  - Selenium
- MSD (Lab ID: 1213278)
  - Selenium

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10194527

**Method:** EPA 200.8
**Description:** 200.8 MET ICPMS, Dissolved
**Client:** Agrium- Nu-West
**Date:** July 03, 2012

**General Information:**
4 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

B: Analyte was detected in the associated method blank.
- IA1-30A-060512 (Lab ID: 10194527001)

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/32938

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10194527001,10194764004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- MS (Lab ID: 1216100)
  - Calcium, Dissolved
  - Selenium, Dissolved
- MSD (Lab ID: 1216101)
  - Calcium, Dissolved
  - Magnesium, Dissolved

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- MS (Lab ID: 1216102)
  - Calcium, Dissolved

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10194527

**Method:** **EPA 200.8**
**Description:** 200.8 MET ICPMS, Dissolved
**Client:** Agrium- Nu-West
**Date:** July 03, 2012

**Duplicate Sample:**
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10194527

**Sample: IA1-30A-060512** **Lab ID: 10194527001** Collected: 06/05/12 13:05 Received: 06/07/12 10:10 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0013** | mg/L | 0.000080 | 0.000028 | 1 | 06/12/12 12:21 | 06/19/12 23:58 | 7440-43-9 | |
| Chromium | **0.0071** | mg/L | 0.00050 | 0.000094 | 1 | 06/12/12 12:21 | 06/19/12 23:58 | 7440-47-3 | |
| Nickel | **0.012** | mg/L | 0.00050 | 0.000091 | 1 | 06/12/12 12:21 | 06/19/12 23:58 | 7440-02-0 | |
| Selenium | **1.8** | mg/L | 0.0025 | 0.0011 | 5 | 06/12/12 12:21 | 06/20/12 00:12 | 7782-49-2 | M1 |
| Vanadium | **0.036** | mg/L | 0.00010 | 0.000027 | 1 | 06/12/12 12:21 | 06/19/12 23:58 | 7440-62-2 | |
| Zinc | **0.045** | mg/L | 0.0050 | 0.0025 | 1 | 06/12/12 12:21 | 06/19/12 23:58 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0013** | mg/L | 0.000080 | 0.000028 | 1 | 06/13/12 13:02 | 06/19/12 19:12 | 7440-43-9 | |
| Calcium, Dissolved | **101** | mg/L | 0.10 | 0.042 | 5 | 06/13/12 13:02 | 06/19/12 19:27 | 7440-70-2 | M1 |
| Chromium, Dissolved | **0.0073** | mg/L | 0.00050 | 0.000094 | 1 | 06/13/12 13:02 | 06/19/12 19:12 | 7440-47-3 | |
| Magnesium, Dissolved | **20.8** | mg/L | 0.0050 | 0.0019 | 1 | 06/13/12 13:02 | 06/19/12 19:12 | 7439-95-4 | M1 |
| Nickel, Dissolved | **0.012** | mg/L | 0.00050 | 0.000091 | 1 | 06/13/12 13:02 | 06/19/12 19:12 | 7440-02-0 | |
| Selenium, Dissolved | **1.9** | mg/L | 0.0025 | 0.0011 | 5 | 06/13/12 13:02 | 06/19/12 19:27 | 7782-49-2 | M1 |
| Total Hardness by 2340B, Dissolved | **337** | mg/L | 0.36 | 0.18 | 5 | 06/13/12 13:02 | 06/19/12 19:27 | | |
| Vanadium, Dissolved | **0.039** | mg/L | 0.00010 | 0.000027 | 1 | 06/13/12 13:02 | 06/19/12 19:12 | 7440-62-2 | |
| Zinc, Dissolved | **0.048** | mg/L | 0.0050 | 0.0025 | 1 | 06/13/12 13:02 | 06/19/12 19:12 | 7440-66-6 | |

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10194527

**Sample: IA1-28A-060512** **Lab ID: 10194527002** Collected: 06/05/12 13:20 Received: 06/07/12 10:10 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0019** | mg/L | 0.000080 | 0.000028 | 1 | 06/12/12 12:21 | 06/19/12 23:40 | 7440-43-9 | |
| Chromium | **0.0076** | mg/L | 0.00050 | 0.000094 | 1 | 06/12/12 12:21 | 06/19/12 23:40 | 7440-47-3 | |
| Nickel | **0.015** | mg/L | 0.00050 | 0.000091 | 1 | 06/12/12 12:21 | 06/19/12 23:40 | 7440-02-0 | |
| Selenium | **1.7** | mg/L | 0.0025 | 0.0011 | 5 | 06/12/12 12:21 | 06/20/12 23:23 | 7782-49-2 | |
| Vanadium | **0.044** | mg/L | 0.00010 | 0.000027 | 1 | 06/12/12 12:21 | 06/19/12 23:40 | 7440-62-2 | |
| Zinc | **0.064** | mg/L | 0.0050 | 0.0025 | 1 | 06/12/12 12:21 | 06/19/12 23:40 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0017** | mg/L | 0.000080 | 0.000028 | 1 | 06/13/12 13:02 | 06/19/12 19:31 | 7440-43-9 | |
| Calcium, Dissolved | **97.4** | mg/L | 0.10 | 0.042 | 5 | 06/13/12 13:02 | 06/19/12 19:36 | 7440-70-2 | |
| Chromium, Dissolved | **0.0074** | mg/L | 0.00050 | 0.000094 | 1 | 06/13/12 13:02 | 06/19/12 19:31 | 7440-47-3 | |
| Magnesium, Dissolved | **20.3** | mg/L | 0.0050 | 0.0019 | 1 | 06/13/12 13:02 | 06/19/12 19:31 | 7439-95-4 | |
| Nickel, Dissolved | **0.015** | mg/L | 0.00050 | 0.000091 | 1 | 06/13/12 13:02 | 06/19/12 19:31 | 7440-02-0 | |
| Selenium, Dissolved | **1.9** | mg/L | 0.0025 | 0.0011 | 5 | 06/13/12 13:02 | 06/19/12 19:36 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **327** | mg/L | 0.36 | 0.18 | 5 | 06/13/12 13:02 | 06/19/12 19:36 | | |
| Vanadium, Dissolved | **0.044** | mg/L | 0.00010 | 0.000027 | 1 | 06/13/12 13:02 | 06/19/12 19:31 | 7440-62-2 | |
| Zinc, Dissolved | **0.065** | mg/L | 0.0050 | 0.0025 | 1 | 06/13/12 13:02 | 06/19/12 19:31 | 7440-66-6 | |

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10194527

**Sample: IA1-55-060512** **Lab ID: 10194527003** Collected: 06/05/12 13:40 Received: 06/07/12 10:10 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0019** | mg/L | 0.000080 | 0.000028 | 1 | 06/12/12 12:21 | 06/19/12 23:45 | 7440-43-9 | |
| Chromium | **0.0072** | mg/L | 0.00050 | 0.000094 | 1 | 06/12/12 12:21 | 06/19/12 23:45 | 7440-47-3 | |
| Nickel | **0.017** | mg/L | 0.00050 | 0.000091 | 1 | 06/12/12 12:21 | 06/19/12 23:45 | 7440-02-0 | |
| Selenium | **2.0** | mg/L | 0.0025 | 0.0011 | 5 | 06/12/12 12:21 | 06/20/12 23:28 | 7782-49-2 | |
| Vanadium | **0.041** | mg/L | 0.00010 | 0.000027 | 1 | 06/12/12 12:21 | 06/19/12 23:45 | 7440-62-2 | |
| Zinc | **0.080** | mg/L | 0.0050 | 0.0025 | 1 | 06/12/12 12:21 | 06/19/12 23:45 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0021** | mg/L | 0.000080 | 0.000028 | 1 | 06/13/12 13:02 | 06/19/12 19:41 | 7440-43-9 | |
| Calcium, Dissolved | **102** | mg/L | 0.10 | 0.042 | 5 | 06/13/12 13:02 | 06/19/12 19:46 | 7440-70-2 | |
| Chromium, Dissolved | **0.0072** | mg/L | 0.00050 | 0.000094 | 1 | 06/13/12 13:02 | 06/19/12 19:41 | 7440-47-3 | |
| Magnesium, Dissolved | **20.8** | mg/L | 0.0050 | 0.0019 | 1 | 06/13/12 13:02 | 06/19/12 19:41 | 7439-95-4 | |
| Nickel, Dissolved | **0.017** | mg/L | 0.00050 | 0.000091 | 1 | 06/13/12 13:02 | 06/19/12 19:41 | 7440-02-0 | |
| Selenium, Dissolved | **1.9** | mg/L | 0.0025 | 0.0011 | 5 | 06/13/12 13:02 | 06/19/12 19:46 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **341** | mg/L | 0.36 | 0.18 | 5 | 06/13/12 13:02 | 06/19/12 19:46 | | |
| Vanadium, Dissolved | **0.042** | mg/L | 0.00010 | 0.000027 | 1 | 06/13/12 13:02 | 06/19/12 19:41 | 7440-62-2 | |
| Zinc, Dissolved | **0.082** | mg/L | 0.0050 | 0.0025 | 1 | 06/13/12 13:02 | 06/19/12 19:41 | 7440-66-6 | |

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10194527

**Sample: DUP-060512-A** **Lab ID: 10194527004** Collected: 06/05/12 12:45 Received: 06/07/12 10:10 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0018** | mg/L | 0.000080 | 0.000028 | 1 | 06/12/12 12:21 | 06/19/12 23:49 | 7440-43-9 | |
| Chromium | **0.0076** | mg/L | 0.00050 | 0.000094 | 1 | 06/12/12 12:21 | 06/19/12 23:49 | 7440-47-3 | |
| Nickel | **0.015** | mg/L | 0.00050 | 0.000091 | 1 | 06/12/12 12:21 | 06/19/12 23:49 | 7440-02-0 | |
| Selenium | **1.8** | mg/L | 0.0025 | 0.0011 | 5 | 06/12/12 12:21 | 06/20/12 23:32 | 7782-49-2 | |
| Vanadium | **0.042** | mg/L | 0.00010 | 0.000027 | 1 | 06/12/12 12:21 | 06/19/12 23:49 | 7440-62-2 | |
| Zinc | **0.064** | mg/L | 0.0050 | 0.0025 | 1 | 06/12/12 12:21 | 06/19/12 23:49 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0018** | mg/L | 0.000080 | 0.000028 | 1 | 06/13/12 13:02 | 06/19/12 20:00 | 7440-43-9 | |
| Calcium, Dissolved | **99.9** | mg/L | 0.10 | 0.042 | 5 | 06/13/12 13:02 | 06/19/12 20:05 | 7440-70-2 | |
| Chromium, Dissolved | **0.0079** | mg/L | 0.00050 | 0.000094 | 1 | 06/13/12 13:02 | 06/19/12 20:00 | 7440-47-3 | |
| Magnesium, Dissolved | **21.1** | mg/L | 0.0050 | 0.0019 | 1 | 06/13/12 13:02 | 06/19/12 20:00 | 7439-95-4 | |
| Nickel, Dissolved | **0.015** | mg/L | 0.00050 | 0.000091 | 1 | 06/13/12 13:02 | 06/19/12 20:00 | 7440-02-0 | |
| Selenium, Dissolved | **1.9** | mg/L | 0.0025 | 0.0011 | 5 | 06/13/12 13:02 | 06/19/12 20:05 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **336** | mg/L | 0.36 | 0.18 | 5 | 06/13/12 13:02 | 06/19/12 20:05 | | |
| Vanadium, Dissolved | **0.045** | mg/L | 0.00010 | 0.000027 | 1 | 06/13/12 13:02 | 06/19/12 20:00 | 7440-62-2 | |
| Zinc, Dissolved | **0.067** | mg/L | 0.0050 | 0.0025 | 1 | 06/13/12 13:02 | 06/19/12 20:00 | 7440-66-6 | |

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## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10194527

QC Batch: MPRP/32866 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10194527001, 10194527002, 10194527003, 10194527004

METHOD BLANK: 1213275 Matrix: Water
Associated Lab Samples: 10194527001, 10194527002, 10194527003, 10194527004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Cadmium | mg/L | <0.000028 | 0.000080 | 06/21/12 06:53 | |
| Chromium | mg/L | <0.000094 | 0.00050 | 06/21/12 06:53 | |
| Nickel | mg/L | <0.000091 | 0.00050 | 06/21/12 06:53 | |
| Selenium | mg/L | <0.00022 | 0.00050 | 06/21/12 06:53 | |
| Vanadium | mg/L | <0.000027 | 0.00010 | 06/21/12 06:53 | |
| Zinc | mg/L | <0.0025 | 0.0050 | 06/21/12 06:53 | |

LABORATORY CONTROL SAMPLE: 1213276

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Cadmium | mg/L | .08 | 0.081 | 101 | 85-115 | |
| Chromium | mg/L | .08 | 0.081 | 101 | 85-115 | |
| Nickel | mg/L | .08 | 0.083 | 103 | 85-115 | |
| Selenium | mg/L | .08 | 0.080 | 100 | 85-115 | |
| Vanadium | mg/L | .08 | 0.079 | 99 | 85-115 | |
| Zinc | mg/L | .08 | 0.081 | 101 | 85-115 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1213277 1213278

| Parameter | Units | 10194527001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cadmium | mg/L | 0.0013 | .08 | .08 | 0.082 | 0.082 | 100 | 101 | 70-130 | .4 | 20 | |
| Chromium | mg/L | 0.0071 | .08 | .08 | 0.088 | 0.085 | 101 | 97 | 70-130 | 4 | 20 | |
| Nickel | mg/L | 0.012 | .08 | .08 | 0.091 | 0.089 | 100 | 97 | 70-130 | 3 | 20 | |
| Selenium | mg/L | 1.8 | .08 | .08 | 2.0 | 1.9 | 152 | 97 | 70-130 | 2 | 20 | E,M1 |
| Vanadium | mg/L | 0.036 | .08 | .08 | 0.12 | 0.11 | 103 | 97 | 70-130 | 4 | 20 | |
| Zinc | mg/L | 0.045 | .08 | .08 | 0.13 | 0.12 | 101 | 98 | 70-130 | 2 | 20 | |

MATRIX SPIKE SAMPLE: 1213279

| Parameter | Units | 10194550007 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Cadmium | mg/L | <0.000028 | .08 | 0.083 | 104 | 70-130 | |
| Chromium | mg/L | 0.0011 | .08 | 0.081 | 100 | 70-130 | |
| Nickel | mg/L | 0.0011 | .08 | 0.081 | 100 | 70-130 | |
| Selenium | mg/L | 0.00044J | .08 | 0.077 | 96 | 70-130 | |
| Vanadium | mg/L | 1.6 ug/L | .08 | 0.081 | 99 | 70-130 | |
| Zinc | mg/L | 0.0046J | .08 | 0.087 | 103 | 70-130 | |



**REPORT OF LABORATORY ANALYSIS**

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## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10194527

QC Batch: MPRP/32938 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10194527001, 10194527002, 10194527003, 10194527004

METHOD BLANK: 1216098 Matrix: Water
Associated Lab Samples: 10194527001, 10194527002, 10194527003, 10194527004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | <0.000028 | 0.000080 | 06/19/12 19:03 | |
| Calcium, Dissolved | mg/L | <0.0083 | 0.020 | 06/19/12 19:03 | |
| Chromium, Dissolved | mg/L | <0.000094 | 0.00050 | 06/19/12 19:03 | |
| Magnesium, Dissolved | mg/L | <0.0019 | 0.0050 | 06/19/12 19:03 | |
| Nickel, Dissolved | mg/L | <0.000091 | 0.00050 | 06/19/12 19:03 | |
| Selenium, Dissolved | mg/L | <0.00022 | 0.00050 | 06/19/12 19:03 | |
| Total Hardness by 2340B, Dissolved | mg/L | <0.036 | 0.071 | 06/19/12 19:03 | |
| Vanadium, Dissolved | mg/L | <0.000027 | 0.00010 | 06/19/12 19:03 | |
| Zinc, Dissolved | mg/L | <0.0025 | 0.0050 | 06/19/12 19:03 | |

LABORATORY CONTROL SAMPLE: 1216099

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | .08 | 0.084 | 105 | 85-115 | |
| Calcium, Dissolved | mg/L | 1 | 1.0 | 101 | 85-115 | |
| Chromium, Dissolved | mg/L | .08 | 0.082 | 102 | 85-115 | |
| Magnesium, Dissolved | mg/L | 1 | 1.0 | 100 | 85-115 | |
| Nickel, Dissolved | mg/L | .08 | 0.078 | 98 | 85-115 | |
| Selenium, Dissolved | mg/L | .08 | 0.080 | 100 | 85-115 | |
| Total Hardness by 2340B, Dissolved | mg/L | 6.6 | 6.6 | 100 | 85-115 | |
| Vanadium, Dissolved | mg/L | .08 | 0.084 | 105 | 85-115 | |
| Zinc, Dissolved | mg/L | .08 | 0.085 | 106 | 85-115 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1216100 1216101

| Parameter | Units | 10194527001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | 0.0013 | .08 | .08 | 0.084 | 0.089 | 104 | 109 | 70-130 | 5 | 20 | |
| Calcium, Dissolved | mg/L | 101 | 1 | 1 | 102 | 106 | 145 | 490 | 70-130 | 3 | 20 | M1 |
| Chromium, Dissolved | mg/L | 0.0073 | .08 | .08 | 0.088 | 0.092 | 100 | 106 | 70-130 | 5 | 20 | |
| Magnesium, Dissolved | mg/L | 20.8 | 1 | 1 | 22.0 | 23.2 | 129 | 246 | 70-130 | 5 | 20 | M1 |
| Nickel, Dissolved | mg/L | 0.012 | .08 | .08 | 0.088 | 0.091 | 95 | 99 | 70-130 | 4 | 20 | |
| Selenium, Dissolved | mg/L | 1.9 | .08 | .08 | 1.9 | 2.0 | -2 | 124 | 70-130 | 5 | 20 | M1 |
| Total Hardness by 2340B, Dissolved | mg/L | 337 | 6.6 | 6.6 | 346 | 359 | 135 | 338 | 70-130 | 4 | 20 | |
| Vanadium, Dissolved | mg/L | 0.039 | .08 | .08 | 0.12 | 0.13 | 102 | 110 | 70-130 | 5 | 20 | |
| Zinc, Dissolved | mg/L | 0.048 | .08 | .08 | 0.13 | 0.13 | 103 | 107 | 70-130 | 2 | 20 | |

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1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10194527

MATRIX SPIKE SAMPLE: 1216102

| Parameter | Units | 10194764004 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | ND | .08 | 0.078 | 98 | 70-130 | |
| Calcium, Dissolved | mg/L | 22.4 | 1 | 25.6 | 316 | 70-130 | M6 |
| Chromium, Dissolved | mg/L | ND | .08 | 0.075 | 94 | 70-130 | |
| Magnesium, Dissolved | mg/L | 4.3 | 1 | 5.5 | 119 | 70-130 | |
| Nickel, Dissolved | mg/L | ND | .08 | 0.076 | 95 | 70-130 | |
| Selenium, Dissolved | mg/L | ND | .08 | 0.077 | 96 | 70-130 | |
| Total Hardness by 2340B, Dissolved | mg/L | 73500 ug/L | 6.6 | 86.3 | 193 | 70-130 | |
| Vanadium, Dissolved | mg/L | ND | .08 | 0.076 | 95 | 70-130 | |
| Zinc, Dissolved | mg/L | ND | .08 | 0.090 | 105 | 70-130 | |

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## QUALIFIERS

Project: North Maybe Mine
Pace Project No.: 10194527

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

| | |
|---|---|
| E | Analyte concentration exceeded the calibration range. The reported result is estimated. |
| M1 | Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery. |
| M6 | Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution. |

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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: North Maybe Mine
Pace Project No.: 10194527

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **10194527001** | **IA1-30A-060512** | EPA 200.8 | MPRP/32866 | EPA 200.8 | ICPM/13036 |
| **10194527002** | **IA1-28A-060512** | EPA 200.8 | MPRP/32866 | EPA 200.8 | ICPM/13036 |
| **10194527003** | **IA1-55-060512** | EPA 200.8 | MPRP/32866 | EPA 200.8 | ICPM/13036 |
| **10194527004** | **DUP-060512-A** | EPA 200.8 | MPRP/32866 | EPA 200.8 | ICPM/13036 |
| **10194527001** | **IA1-30A-060512** | EPA 200.8 | MPRP/32938 | EPA 200.8 | ICPM/13028 |
| **10194527002** | **IA1-28A-060512** | EPA 200.8 | MPRP/32938 | EPA 200.8 | ICPM/13028 |
| **10194527003** | **IA1-55-060512** | EPA 200.8 | MPRP/32938 | EPA 200.8 | ICPM/13028 |
| **10194527004** | **DUP-060512-A** | EPA 200.8 | MPRP/32938 | EPA 200.8 | ICPM/13028 |

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RUSH
CW 6.5.12

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10194527

1120

Page: 1 of 1

**Section A** Required Client Information:

| | |
|---|---|
| Company: | Agrium/Nu-West |
| Address: | 3010 Conda Rd |
| | Soda Springs, ID. 83276 |
| Email To: | Mitchell.Hart@agrium.com |
| Phone: 208-547-3935 | Fax: |
| Requested Due Date/TAT: | 7-10 Business Days |

**Section B** Required Project Information:

| | |
|---|---|
| Report To: | James.Williams@agrium.com |
| Copy To: | Julie.Lincoln@aecom.com |
| | |
| Purchase Order No.: | 4800058265 |
| Project Name: | North Maybe Mine |
| Project Number: | |

**Section C** Invoice Information:

| | |
|---|---|
| Attention: | Accounts Payable |
| Company Name: | Nu-West Industries, Inc. |
| Address: | Calgary, Alberta, Canada T2H 3B9 |
| Pace Quote Reference: | Nor_040612_NMM SW |
| Pace Project Manager: | Sally Heinje |
| Pace Profile #: | |

**REGULATORY AGENCY**

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: ID

**Section D** Required Client Information

**SAMPLE ID** (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

| MATRIX | CODE |
|---|---|
| DRINKING WATER | DW |
| WATER | WT |
| WASTE WATER | WW |
| PRODUCT | P |
| SOIL/SOLID | SL |
| OIL | OL |
| WIPE | WP |
| AIR | AR |
| OTHER | OT |
| TISSUE | TS |

| ITEM # | SAMPLE ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED COMPOSITE START DATE | COLLECTED COMPOSITE START TIME | COLLECTED COMPOSITE END/GRAB DATE | COLLECTED COMPOSITE END/GRAB TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Requested Analysis Filtered (Y/N) Y/N | Analysis Test: Table 4-1 (enclosed) | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | IA1-30A-060512 | WT | G | 06/05/12 | | 1305 | | | 2 | | | ✓ | | | | | | | X | | 10194527001 |
| 2 | IA1-28A-060512 | WT | G | 06/05/12 | | 1320 | | | 2 | | | ✓ | | | | | | | X | | 002 |
| 3 | IA1-55-060512 | WT | G | 06/05/12 | | 1340 | | | 2 | | | ✓ | | | | | | | X | | 003 |
| 4 | DUP-060512-A | WT | G | 06/05/12 | | 1245 | | | 2 | | | ✓ | | | | | | | X | | 004 |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | |

WO#: 10194527

10194527

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| cooler id # 103366 | James B. Williams | 06/06/12 | 0800 | [signature] | 6.7.12 | 10:10 | 33 | Y | Y | Y |
| Level III data package | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: James B. Williams

SIGNATURE of SAMPLER: James B. Williams

DATE Signed (MM/DD/YY):

| Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N) |
|---|---|---|---|
| | | | |

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

## Table 4-1 Surface water Analyte List for April, May, June, August, September and October

| Analyte | Analytical Method | Container Size | | Container Material | Preservative | Holding Time | Detection Limit/Units |
|---|---|---|---|---|---|---|---|
| | | Total | Dissolved | | | | |
| Cadmium – total & dissolved* | EPA M200.8 | 250 ml | 250 ml* | Polyethylene | Nitric Acid | 180 Days | 0.1 µg/L |
| Chromium – total & dissolved* | EPA M200.8 | | | | | | 0.1 µg/L |
| Nickel – total & dissolved* | EPA M200.8 | | | | | | 0.6 µg/L |
| Selenium – total & dissolved* | EPA M200.8 | | | | | | 0.1 µg/L |
| Vanadium – total & dissolved* | EPA M200.8 | | | | | | 0.2 µg/L |
| Zinc – total & dissolved* | EPA M200.8 | | | | | | 2 µg/L |
| Hardness | EPA SM2340B (Calculated) | - | | Polyethylene | Nitric Acid | 180 Days | 2 mg/L |
| pH | Field | - | - | - | - | Analyze immediately | standard units |
| ORP | Field | - | - | - | - | | mV |
| Dissolved Oxygen | Field | - | - | - | - | | mg/L |
| Conductivity | Field | - | - | - | - | | µmhos/cm |
| Temperature | Field | - | - | - | - | | °C |
| Turbidity | Field | - | - | - | - | | NTU |

* Sample for dissolved analysis will be field filtered using a disposable 0.45 micron filter prior to preservation
ml = milliliters
µg/L = micrograms per liter
mg/L = milligrams per liter
mV = millivolts
µmhos/cm = micromhos per centimeter
°C = degrees Celsius
NTU = nephelometric turbidity units

| Pace Analytical® | Document Name: Sample Condition Upon Receipt Form | Revised Date: 15Feb2012 Page 1 of 1 |
|---|---|---|
| | Document Number: F-MN-L-213-rev.02 | Issuing Authority: Pace Minnesota Quality Office |

**Sample Condition Upon Receipt**

Client Name: Agrium/Nu-West Project # 10194527

**Courier:** ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

**Tracking #:** 8992 6652 2016

**Custody Seal on Cooler/Box Present:** ☑ yes ☐ no Seals Intact: ☑ yes ☐ no

[redacted]

**Packing Material:** ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☑ Other _____ Temp Blank: Yes ☑ No ☐

**Thermometer Used** 80344042 or 80512447 **Type of Ice:** (Wet) Blue None ☐ Samples on ice, cooling process has begun

**Cooler Temperature** 3.5 **Biological Tissue is Frozen:** Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: C.W 6.17.12

| | | Comments: |
|---|---|---|
| Chain of Custody Present: | ☑Yes ☐No ☐N/A | 1. |
| Chain of Custody Filled Out: | ☑Yes ☐No ☐N/A | 2. |
| Chain of Custody Relinquished: | ☑Yes ☐No ☐N/A | 3. |
| Sampler Name & Signature on COC: | ☑Yes ☐No ☐N/A | 4. |
| Samples Arrived within Hold Time: | ☑Yes ☐No ☐N/A | 5. |
| Short Hold Time Analysis (<72hr): | ☐Yes ☑No ☐N/A | 6. |
| Rush Turn Around Time Requested: | ☐Yes ☑No ☐N/A | 7. |
| Sufficient Volume: | ☑Yes ☐No ☐N/A | 8. |
| Correct Containers Used: | ☑Yes ☐No ☐N/A | 9. |
| -Pace Containers Used: | ☑Yes ☐No ☐N/A | |
| Containers Intact: | ☑Yes ☐No ☐N/A | 10. |
| Filtered volume received for Dissolved tests | ☐Yes ☐No ☑N/A | 11. |
| Sample Labels match COC: | ☑Yes ☐No ☐N/A | 12. |
| -Includes date/time/ID/Analysis Matrix: WT | | |
| All containers needing acid/base preservation have been checked. Noncompliance are noted in 13. | ☑Yes ☐No ☐N/A | 13. ☑ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl |
| All containers needing preservation are found to be in compliance with EPA recommendation. (HNO3, H2SO4, HCL<2; NaOH >12) | ☑Yes ☐No ☐N/A | Samp # 30A-060512 2/2 55-060512 2/2 38A-060512 2/2 DUP060512-A 2/2 |
| Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water) | ☐Yes ☑No | Initial when completed C.W Lot # of added preservative |
| Headspace in VOA Vials ( >6mm): | ☐Yes ☐No ☑N/A | 14. |
| Trip Blank Present: | ☐Yes ☐No ☑N/A | 15. |
| Trip Blank Custody Seals Present | ☐Yes ☐No ☑N/A | |
| Pace Trip Blank Lot # (if purchased): | | |

**Client Notification/ Resolution:** Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

**Project Manager Review:** _____ **Date:** _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers)

# DATA VALIDATION REPORT

| | |
|---|---|
| Company: | AECOM Environment |
| Project Name: | Agrium, Inc. |
| Laboratory: | Pace Analytical Services, Inc. |
| Pace Project ID: | 10198100 |
| Data Validator: | Chris Davis |
| Date Validated: | December 5, 2012 |
| Reviewer: | Julie Lincoln |
| Date Reviewed: | December 7, 2012 |
| Sample Media: | Surface Water |

Analytical Parameters and Methods:

1. Total and Dissolved Metals (cadmium, chromium, nickel, selenium, vanadium, and zinc); 200.8
2. Total and Dissolved Cations (calcium, magnesium, potassium, and sodium); 200.8
3. Hardness; SM2340B
4. Alkalinity; SM2320B (total, carbonate, bicarbonate, and hydroxide alkalinity as calcium carbonate)
5. Anions; 300.0 (chloride and sulfate)
6. Total Anions, Total Cations, and Cation/Anion Balance; SM1030E

Sample Identifications:
IA1-30A-070512
IA1-28A-070512
IA1-55-070512
DUP-070512-A (field duplicate for IA1-55-070512)

## 1. PRESERVATION AND HOLDING TIMES

Preservation: Acceptable.

Holding Time: Acceptable.

## 2. BLANKS

Non-detected, except laboratory reagent blanks (LRBs) or continuing calibration blanks (CCBs) at the following maximum concentrations in the specified batches for:

Dissolved calcium at 0.013 mg/L (LRB MPRP/33655)

Dissolved magnesium at 0.0049 mg/L (LRB MPRP/33655)

Dissolved hardness at 0.052 mg/L (LRB MPRP/33655)

Total potassium at 0.012 mg/L (LRB MPRP/33661)

**Qualification:** No qualification was necessary. All sample results were greater than 10-times the concentrations in the associated blanks.

## 3. LABORATORY CONTROL SAMPLES

Acceptable.

## 4. DUPLICATE ANALYSES

Acceptable.

## 5. SPIKE SAMPLE ANALYSES

Acceptable.

## 6. OVERALL ASSESSMENT

No other issues were identified.

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July 30, 2012

Mitchell Hart
Nu-West Industries, Inc
3010 Conda Road
Soda Springs, ID 83276

RE: Project: North Maybe Mine
Pace Project No.: 10198100

Dear Mitchell Hart:
Enclosed are the analytical results for sample(s) received by the laboratory on July 10, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Cindy Emmons, Norwest Corporation
James Williams, Agrium

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## CERTIFICATIONS

Project: North Maybe Mine
Pace Project No.: 10198100

**Minnesota Certification IDs**
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Virginia/DCLS Certification #: 002521
Virginia/VELAP Certification #: 460163
Washington Certification #: C754
Wisconsin Certification #: 999407970

**Montana Certification IDs**
602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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## SAMPLE SUMMARY

Project: North Maybe Mine
Pace Project No.: 10198100

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| 10198100001 | IA1-30A-070512 | Water | 07/05/12 10:45 | 07/10/12 10:13 |
| 10198100002 | IA1-28A-070512 | Water | 07/05/12 10:55 | 07/10/12 10:13 |
| 10198100003 | IA1-55-070512 | Water | 07/05/12 11:15 | 07/10/12 10:13 |
| 10198100004 | DUP-070512-A | Water | 07/05/12 11:30 | 07/10/12 10:13 |

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## SAMPLE ANALYTE COUNT

Project: North Maybe Mine
Pace Project No.: 10198100

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| 10198100001 | IA1-30A-070512 | EPA 200.8 | RR1 | 11 | PASI-M |
| | | EPA 200.8 | RR1 | 11 | PASI-M |
| | | EPA 300.0 | MFP | 2 | PASI-MT |
| | | SM 2320B | ECB | 3 | PASI-M |
| | | SM 1030E | CB | 3 | PASI-M |
| 10198100002 | IA1-28A-070512 | EPA 200.8 | RR1 | 11 | PASI-M |
| | | EPA 200.8 | RR1 | 11 | PASI-M |
| | | EPA 300.0 | MFP | 2 | PASI-MT |
| | | SM 2320B | ECB | 3 | PASI-M |
| | | SM 1030E | CB | 3 | PASI-M |
| 10198100003 | IA1-55-070512 | EPA 200.8 | RR1 | 11 | PASI-M |
| | | EPA 200.8 | RR1 | 11 | PASI-M |
| | | EPA 300.0 | MFP | 2 | PASI-MT |
| | | SM 2320B | ECB | 3 | PASI-M |
| | | SM 1030E | CB | 3 | PASI-M |
| 10198100004 | DUP-070512-A | EPA 200.8 | RR1 | 11 | PASI-M |
| | | EPA 200.8 | RR1 | 11 | PASI-M |
| | | EPA 300.0 | MFP | 2 | PASI-MT |
| | | SM 2320B | ECB | 3 | PASI-M |
| | | SM 1030E | CB | 3 | PASI-M |

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10198100

**Method:** EPA 200.8
**Description:** 200.8 MET ICPMS
**Client:** Agrium- Nu-West
**Date:** July 30, 2012

**General Information:**
4 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

B: Analyte was detected in the associated method blank.
- DUP-070512-A (Lab ID: 10198100004)
- IA1-28A-070512 (Lab ID: 10198100002)
- IA1-30A-070512 (Lab ID: 10198100001)
- IA1-55-070512 (Lab ID: 10198100003)

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/33661

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10198100001,10198274005

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- MS (Lab ID: 1238413)
  - Calcium
  - Magnesium
  - Sodium
- MSD (Lab ID: 1238414)
  - Calcium
  - Magnesium

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10198100

**Method:** **EPA 200.8**
**Description:** 200.8 MET ICPMS
**Client:** Agrium- Nu-West
**Date:** July 30, 2012

**Additional Comments:**

Analyte Comments:

QC Batch: MPRP/33661

B: Analyte was detected in the associated method blank.
- DUP-070512-A (Lab ID: 10198100004)
  - Potassium
- IA1-28A-070512 (Lab ID: 10198100002)
  - Potassium
- IA1-30A-070512 (Lab ID: 10198100001)
  - Potassium
- IA1-55-070512 (Lab ID: 10198100003)
  - Potassium

E: Analyte concentration exceeded the calibration range. The reported result is estimated.
- MS (Lab ID: 1238413)
  - Calcium
  - Magnesium
- MSD (Lab ID: 1238414)
  - Calcium
  - Magnesium

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10198100

**Method:** EPA 200.8
**Description:** 200.8 MET ICPMS, Dissolved
**Client:** Agrium- Nu-West
**Date:** July 30, 2012

**General Information:**
4 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

B: Analyte was detected in the associated method blank.
- DUP-070512-A (Lab ID: 10198100004)
- IA1-28A-070512 (Lab ID: 10198100002)
- IA1-30A-070512 (Lab ID: 10198100001)
- IA1-55-070512 (Lab ID: 10198100003)

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/33655

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10198138001,10198274005

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- MS (Lab ID: 1238383)
  - Calcium, Dissolved
  - Magnesium, Dissolved
  - Sodium, Dissolved
- MS (Lab ID: 1238384)
  - Calcium, Dissolved
  - Magnesium, Dissolved
- MSD (Lab ID: 1238385)

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10198100

**Method:** EPA 200.8
**Description:** 200.8 MET ICPMS, Dissolved
**Client:** Agrium- Nu-West
**Date:** July 30, 2012

QC Batch: MPRP/33655

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10198138001,10198274005

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- Calcium, Dissolved
- Magnesium, Dissolved

**Additional Comments:**

Analyte Comments:

QC Batch: MPRP/33655

B: Analyte was detected in the associated method blank.

- DUP-070512-A (Lab ID: 10198100004)
  - Calcium, Dissolved
  - Magnesium, Dissolved
- IA1-28A-070512 (Lab ID: 10198100002)
  - Calcium, Dissolved
  - Magnesium, Dissolved
- IA1-30A-070512 (Lab ID: 10198100001)
  - Calcium, Dissolved
  - Magnesium, Dissolved
- IA1-55-070512 (Lab ID: 10198100003)
  - Calcium, Dissolved
  - Magnesium, Dissolved

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1238383)
  - Calcium, Dissolved
  - Magnesium, Dissolved
  - Calcium, Dissolved
  - Magnesium, Dissolved
- MSD (Lab ID: 1238385)
  - Calcium, Dissolved
  - Magnesium, Dissolved

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10198100

**Method:** EPA 300.0
**Description:** 300.0 IC Anions
**Client:** Agrium- Nu-West
**Date:** July 30, 2012

**General Information:**
4 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**
All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: MT/9411

1M: Centrifuged prior to analysis.
- BLANK (Lab ID: 1241210)
  - Chloride
  - Sulfate
- LCS (Lab ID: 1241211)
  - Chloride
  - Sulfate

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10198100

**Method:** **EPA 300.0**
**Description:** 300.0 IC Anions
**Client:** Agrium- Nu-West
**Date:** July 30, 2012

Analyte Comments:

QC Batch: MT/9411

2M: Sample was centrifuged due to particulate contamination.
- IA1-28A-070512 (Lab ID: 10198100002)
  - Sulfate

E: Analyte concentration exceeded the calibration range. The reported result is estimated.
- LCS (Lab ID: 1241174)
  - Chloride
  - Chloride

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10198100

**Method:** **SM 2320B**
**Description:** 2320B Alkalinity
**Client:** Agrium- Nu-West
**Date:** July 30, 2012

**General Information:**
4 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10198100

**Method:** SM 1030E
**Description:** Cation/Anion Balance (Mining)
**Client:** Agrium- Nu-West
**Date:** July 30, 2012

**General Information:**
4 samples were analyzed for SM 1030E. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10198100

**Sample: IA1-30A-070512** **Lab ID: 10198100001** Collected: 07/05/12 10:45 Received: 07/10/12 10:13 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.00081** | mg/L | 0.000080 | 0.000028 | 1 | 07/12/12 13:07 | 07/20/12 23:11 | 7440-43-9 | |
| Calcium | **103** | mg/L | 0.10 | 0.050 | 5 | 07/12/12 13:07 | 07/20/12 23:15 | 7440-70-2 | |
| Chromium | **0.0056** | mg/L | 0.00050 | 0.000094 | 1 | 07/12/12 13:07 | 07/20/12 23:11 | 7440-47-3 | |
| Magnesium | **23.1** | mg/L | 0.025 | 0.012 | 5 | 07/12/12 13:07 | 07/20/12 23:15 | 7439-95-4 | |
| Nickel | **0.0090** | mg/L | 0.00050 | 0.00015 | 1 | 07/12/12 13:07 | 07/20/12 23:11 | 7440-02-0 | |
| Potassium | **1.7** | mg/L | 0.020 | 0.0052 | 1 | 07/12/12 13:07 | 07/20/12 23:11 | 7440-09-7 | B |
| Selenium | **1.8** | mg/L | 0.0025 | 0.00047 | 5 | 07/12/12 13:07 | 07/20/12 23:15 | 7782-49-2 | |
| Sodium | **5.2** | mg/L | 0.050 | 0.010 | 1 | 07/12/12 13:07 | 07/20/12 23:11 | 7440-23-5 | |
| Total Hardness by 2340B | **352** | mg/L | 0.36 | 0.18 | 5 | 07/12/12 13:07 | 07/20/12 23:15 | | |
| Vanadium | **0.028** | mg/L | 0.00010 | 0.000037 | 1 | 07/12/12 13:07 | 07/20/12 23:11 | 7440-62-2 | |
| Zinc | **0.024** | mg/L | 0.0050 | 0.0010 | 1 | 07/12/12 13:07 | 07/20/12 23:11 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.00068** | mg/L | 0.000080 | 0.000028 | 1 | 07/13/12 10:02 | 07/22/12 14:49 | 7440-43-9 | |
| Calcium, Dissolved | **111** | mg/L | 0.20 | 0.10 | 10 | 07/13/12 10:02 | 07/22/12 14:53 | 7440-70-2 | B |
| Chromium, Dissolved | **0.0055** | mg/L | 0.00050 | 0.000094 | 1 | 07/13/12 10:02 | 07/22/12 14:49 | 7440-47-3 | |
| Magnesium, Dissolved | **23.5** | mg/L | 0.050 | 0.023 | 10 | 07/13/12 10:02 | 07/22/12 14:53 | 7439-95-4 | B |
| Nickel, Dissolved | **0.0090** | mg/L | 0.00050 | 0.00015 | 1 | 07/13/12 10:02 | 07/22/12 14:49 | 7440-02-0 | |
| Potassium, Dissolved | **1.8** | mg/L | 0.020 | 0.0052 | 1 | 07/13/12 10:02 | 07/22/12 14:49 | 7440-09-7 | |
| Selenium, Dissolved | **2.0** | mg/L | 0.0050 | 0.00094 | 10 | 07/13/12 10:02 | 07/22/12 14:53 | 7782-49-2 | |
| Sodium, Dissolved | **5.4** | mg/L | 0.050 | 0.010 | 1 | 07/13/12 10:02 | 07/22/12 14:49 | 7440-23-5 | |
| Total Hardness by 2340B, Dissolved | **374** | mg/L | 0.71 | 0.36 | 10 | 07/13/12 10:02 | 07/22/12 14:53 | | |
| Vanadium, Dissolved | **0.029** | mg/L | 0.00010 | 0.000037 | 1 | 07/13/12 10:02 | 07/22/12 14:49 | 7440-62-2 | |
| Zinc, Dissolved | **0.023** | mg/L | 0.0050 | 0.0010 | 1 | 07/13/12 10:02 | 07/22/12 14:49 | 7440-66-6 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0 | | | | | | | | |
| Chloride | **3.6** | mg/L | 2.0 | 0.37 | 2 | | 07/16/12 10:02 | 16887-00-6 | |
| Sulfate | **188** | mg/L | 10.0 | 1.2 | 10 | | 07/16/12 05:07 | 14808-79-8 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B | | | | | | | | |
| Alkalinity,Bicarbonate (CaCO3) | **160** | mg/L | 5.0 | 2.5 | 1 | | 07/11/12 15:23 | | |
| Alkalinity, Carbonate (CaCO3) | **<2.5** | mg/L | 5.0 | 2.5 | 1 | | 07/11/12 15:23 | | |
| Alkalinity, Total as CaCO3 | **160** | mg/L | 5.0 | 2.5 | 1 | | 07/11/12 15:23 | | |
| **Cation/Anion Balance (Mining)** | Analytical Method: SM 1030E | | | | | | | | |
| Cation/Anion Balance | **3.5** | % | | | 1 | | 07/30/12 09:07 | | |
| Total Cations | **7.8** | meq/L | | | 1 | | 07/30/12 09:07 | | |
| Total Anions | **7.2** | meq/L | | | 1 | | 07/30/12 09:07 | | |

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10198100

**Sample: IA1-28A-070512** **Lab ID: 10198100002** Collected: 07/05/12 10:55 Received: 07/10/12 10:13 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0016** | mg/L | 0.000080 | 0.000028 | 1 | 07/12/12 13:07 | 07/20/12 23:43 | 7440-43-9 | |
| Calcium | **98.8** | mg/L | 0.20 | 0.10 | 10 | 07/12/12 13:07 | 07/20/12 23:47 | 7440-70-2 | |
| Chromium | **0.0057** | mg/L | 0.00050 | 0.000094 | 1 | 07/12/12 13:07 | 07/20/12 23:43 | 7440-47-3 | |
| Magnesium | **23.2** | mg/L | 0.050 | 0.023 | 10 | 07/12/12 13:07 | 07/20/12 23:47 | 7439-95-4 | |
| Nickel | **0.016** | mg/L | 0.00050 | 0.00015 | 1 | 07/12/12 13:07 | 07/20/12 23:43 | 7440-02-0 | |
| Potassium | **1.7** | mg/L | 0.020 | 0.0052 | 1 | 07/12/12 13:07 | 07/20/12 23:43 | 7440-09-7 | B |
| Selenium | **1.8** | mg/L | 0.0050 | 0.00094 | 10 | 07/12/12 13:07 | 07/20/12 23:47 | 7782-49-2 | |
| Sodium | **5.2** | mg/L | 0.050 | 0.010 | 1 | 07/12/12 13:07 | 07/20/12 23:43 | 7440-23-5 | |
| Total Hardness by 2340B | **342** | mg/L | 0.71 | 0.36 | 10 | 07/12/12 13:07 | 07/20/12 23:47 | | |
| Vanadium | **0.039** | mg/L | 0.00010 | 0.000037 | 1 | 07/12/12 13:07 | 07/20/12 23:43 | 7440-62-2 | |
| Zinc | **0.059** | mg/L | 0.0050 | 0.0010 | 1 | 07/12/12 13:07 | 07/20/12 23:43 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0011** | mg/L | 0.000080 | 0.000028 | 1 | 07/13/12 10:02 | 07/22/12 15:16 | 7440-43-9 | |
| Calcium, Dissolved | **107** | mg/L | 0.20 | 0.10 | 10 | 07/13/12 10:02 | 07/22/12 15:21 | 7440-70-2 | B |
| Chromium, Dissolved | **0.0053** | mg/L | 0.00050 | 0.000094 | 1 | 07/13/12 10:02 | 07/22/12 15:16 | 7440-47-3 | |
| Magnesium, Dissolved | **22.4** | mg/L | 0.0050 | 0.0023 | 1 | 07/13/12 10:02 | 07/22/12 15:16 | 7439-95-4 | B |
| Nickel, Dissolved | **0.014** | mg/L | 0.00050 | 0.00015 | 1 | 07/13/12 10:02 | 07/22/12 15:16 | 7440-02-0 | |
| Potassium, Dissolved | **1.8** | mg/L | 0.020 | 0.0052 | 1 | 07/13/12 10:02 | 07/22/12 15:16 | 7440-09-7 | |
| Selenium, Dissolved | **2.0** | mg/L | 0.0050 | 0.00094 | 10 | 07/13/12 10:02 | 07/22/12 15:21 | 7782-49-2 | |
| Sodium, Dissolved | **5.2** | mg/L | 0.050 | 0.010 | 1 | 07/13/12 10:02 | 07/22/12 15:16 | 7440-23-5 | |
| Total Hardness by 2340B, Dissolved | **359** | mg/L | 0.71 | 0.36 | 10 | 07/13/12 10:02 | 07/22/12 15:21 | | |
| Vanadium, Dissolved | **0.039** | mg/L | 0.00010 | 0.000037 | 1 | 07/13/12 10:02 | 07/22/12 15:16 | 7440-62-2 | |
| Zinc, Dissolved | **0.043** | mg/L | 0.0050 | 0.0010 | 1 | 07/13/12 10:02 | 07/22/12 15:16 | 7440-66-6 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0 | | | | | | | | |
| Chloride | **4.0** | mg/L | 2.0 | 0.37 | 2 | | 07/16/12 10:31 | 16887-00-6 | |
| Sulfate | **189** | mg/L | 10.0 | 1.2 | 10 | | 07/16/12 05:36 | 14808-79-8 | 2M |
| **2320B Alkalinity** | Analytical Method: SM 2320B | | | | | | | | |
| Alkalinity,Bicarbonate (CaCO3) | **156** | mg/L | 5.0 | 2.5 | 1 | | 07/11/12 15:28 | | |
| Alkalinity, Carbonate (CaCO3) | **<2.5** | mg/L | 5.0 | 2.5 | 1 | | 07/11/12 15:28 | | |
| Alkalinity, Total as CaCO3 | **156** | mg/L | 5.0 | 2.5 | 1 | | 07/11/12 15:28 | | |
| **Cation/Anion Balance (Mining)** | Analytical Method: SM 1030E | | | | | | | | |
| Cation/Anion Balance | **2.0** | % | | | 1 | | 07/30/12 09:07 | | |
| Total Cations | **7.4** | meq/L | | | 1 | | 07/30/12 09:07 | | |
| Total Anions | **7.2** | meq/L | | | 1 | | 07/30/12 09:07 | | |



**REPORT OF LABORATORY ANALYSIS**

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10198100

**Sample: IA1-55-070512** **Lab ID: 10198100003** Collected: 07/05/12 11:15 Received: 07/10/12 10:13 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0021** | mg/L | 0.000080 | 0.000028 | 1 | 07/12/12 13:07 | 07/20/12 23:52 | 7440-43-9 | |
| Calcium | **108** | mg/L | 0.20 | 0.10 | 10 | 07/12/12 13:07 | 07/20/12 23:56 | 7440-70-2 | |
| Chromium | **0.0058** | mg/L | 0.00050 | 0.000094 | 1 | 07/12/12 13:07 | 07/20/12 23:52 | 7440-47-3 | |
| Magnesium | **23.7** | mg/L | 0.050 | 0.023 | 10 | 07/12/12 13:07 | 07/20/12 23:56 | 7439-95-4 | |
| Nickel | **0.019** | mg/L | 0.00050 | 0.00015 | 1 | 07/12/12 13:07 | 07/20/12 23:52 | 7440-02-0 | |
| Potassium | **1.8** | mg/L | 0.020 | 0.0052 | 1 | 07/12/12 13:07 | 07/20/12 23:52 | 7440-09-7 | B |
| Selenium | **1.8** | mg/L | 0.0050 | 0.00094 | 10 | 07/12/12 13:07 | 07/20/12 23:56 | 7782-49-2 | |
| Sodium | **5.2** | mg/L | 0.050 | 0.010 | 1 | 07/12/12 13:07 | 07/20/12 23:52 | 7440-23-5 | |
| Total Hardness by 2340B | **368** | mg/L | 0.71 | 0.36 | 10 | 07/12/12 13:07 | 07/20/12 23:56 | | |
| Vanadium | **0.037** | mg/L | 0.00010 | 0.000037 | 1 | 07/12/12 13:07 | 07/20/12 23:52 | 7440-62-2 | |
| Zinc | **0.083** | mg/L | 0.0050 | 0.0010 | 1 | 07/12/12 13:07 | 07/20/12 23:52 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0021** | mg/L | 0.000080 | 0.000028 | 1 | 07/13/12 10:02 | 07/22/12 15:30 | 7440-43-9 | |
| Calcium, Dissolved | **116** | mg/L | 0.20 | 0.10 | 10 | 07/13/12 10:02 | 07/22/12 15:35 | 7440-70-2 | B |
| Chromium, Dissolved | **0.0057** | mg/L | 0.00050 | 0.000094 | 1 | 07/13/12 10:02 | 07/22/12 15:30 | 7440-47-3 | |
| Magnesium, Dissolved | **23.8** | mg/L | 0.050 | 0.023 | 10 | 07/13/12 10:02 | 07/22/12 15:35 | 7439-95-4 | B |
| Nickel, Dissolved | **0.018** | mg/L | 0.00050 | 0.00015 | 1 | 07/13/12 10:02 | 07/22/12 15:30 | 7440-02-0 | |
| Potassium, Dissolved | **1.9** | mg/L | 0.020 | 0.0052 | 1 | 07/13/12 10:02 | 07/22/12 15:30 | 7440-09-7 | |
| Selenium, Dissolved | **2.1** | mg/L | 0.0050 | 0.00094 | 10 | 07/13/12 10:02 | 07/22/12 15:35 | 7782-49-2 | |
| Sodium, Dissolved | **5.3** | mg/L | 0.050 | 0.010 | 1 | 07/13/12 10:02 | 07/22/12 15:30 | 7440-23-5 | |
| Total Hardness by 2340B, Dissolved | **388** | mg/L | 0.71 | 0.36 | 10 | 07/13/12 10:02 | 07/22/12 15:35 | | |
| Vanadium, Dissolved | **0.039** | mg/L | 0.00010 | 0.000037 | 1 | 07/13/12 10:02 | 07/22/12 15:30 | 7440-62-2 | |
| Zinc, Dissolved | **0.083** | mg/L | 0.0050 | 0.0010 | 1 | 07/13/12 10:02 | 07/22/12 15:30 | 7440-66-6 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0 | | | | | | | | |
| Chloride | **3.8** | mg/L | 2.0 | 0.37 | 2 | | 07/16/12 11:01 | 16887-00-6 | |
| Sulfate | **194** | mg/L | 10.0 | 1.2 | 10 | | 07/16/12 06:06 | 14808-79-8 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B | | | | | | | | |
| Alkalinity,Bicarbonate (CaCO3) | **173** | mg/L | 5.0 | 2.5 | 1 | | 07/11/12 15:33 | | |
| Alkalinity, Carbonate (CaCO3) | **<2.5** | mg/L | 5.0 | 2.5 | 1 | | 07/11/12 15:33 | | |
| Alkalinity, Total as CaCO3 | **173** | mg/L | 5.0 | 2.5 | 1 | | 07/11/12 15:33 | | |
| **Cation/Anion Balance (Mining)** | Analytical Method: SM 1030E | | | | | | | | |
| Cation/Anion Balance | **2.8** | % | | | 1 | | 07/30/12 09:07 | | |
| Total Cations | **8.0** | meq/L | | | 1 | | 07/30/12 09:07 | | |
| Total Anions | **7.6** | meq/L | | | 1 | | 07/30/12 09:07 | | |

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10198100

**Sample: DUP-070512-A** **Lab ID: 10198100004** Collected: 07/05/12 11:30 Received: 07/10/12 10:13 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0021** | mg/L | 0.000080 | 0.000028 | 1 | 07/12/12 13:07 | 07/21/12 00:01 | 7440-43-9 | |
| Calcium | **110** | mg/L | 0.20 | 0.10 | 10 | 07/12/12 13:07 | 07/21/12 00:06 | 7440-70-2 | |
| Chromium | **0.0058** | mg/L | 0.00050 | 0.000094 | 1 | 07/12/12 13:07 | 07/21/12 00:01 | 7440-47-3 | |
| Magnesium | **23.5** | mg/L | 0.050 | 0.023 | 10 | 07/12/12 13:07 | 07/21/12 00:06 | 7439-95-4 | |
| Nickel | **0.019** | mg/L | 0.00050 | 0.00015 | 1 | 07/12/12 13:07 | 07/21/12 00:01 | 7440-02-0 | |
| Potassium | **1.8** | mg/L | 0.020 | 0.0052 | 1 | 07/12/12 13:07 | 07/21/12 00:01 | 7440-09-7 | B |
| Selenium | **1.8** | mg/L | 0.0050 | 0.00094 | 10 | 07/12/12 13:07 | 07/21/12 00:06 | 7782-49-2 | |
| Sodium | **5.2** | mg/L | 0.050 | 0.010 | 1 | 07/12/12 13:07 | 07/21/12 00:01 | 7440-23-5 | |
| Total Hardness by 2340B | **372** | mg/L | 0.71 | 0.36 | 10 | 07/12/12 13:07 | 07/21/12 00:06 | | |
| Vanadium | **0.037** | mg/L | 0.00010 | 0.000037 | 1 | 07/12/12 13:07 | 07/21/12 00:01 | 7440-62-2 | |
| Zinc | **0.082** | mg/L | 0.0050 | 0.0010 | 1 | 07/12/12 13:07 | 07/21/12 00:01 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0020** | mg/L | 0.000080 | 0.000028 | 1 | 07/13/12 10:02 | 07/22/12 15:44 | 7440-43-9 | |
| Calcium, Dissolved | **114** | mg/L | 0.20 | 0.10 | 10 | 07/13/12 10:02 | 07/22/12 15:48 | 7440-70-2 | B |
| Chromium, Dissolved | **0.0055** | mg/L | 0.00050 | 0.000094 | 1 | 07/13/12 10:02 | 07/22/12 15:44 | 7440-47-3 | |
| Magnesium, Dissolved | **21.9** | mg/L | 0.0050 | 0.0023 | 1 | 07/13/12 10:02 | 07/22/12 15:44 | 7439-95-4 | B |
| Nickel, Dissolved | **0.017** | mg/L | 0.00050 | 0.00015 | 1 | 07/13/12 10:02 | 07/22/12 15:44 | 7440-02-0 | |
| Potassium, Dissolved | **1.8** | mg/L | 0.020 | 0.0052 | 1 | 07/13/12 10:02 | 07/22/12 15:44 | 7440-09-7 | |
| Selenium, Dissolved | **2.0** | mg/L | 0.0050 | 0.00094 | 10 | 07/13/12 10:02 | 07/22/12 15:48 | 7782-49-2 | |
| Sodium, Dissolved | **5.1** | mg/L | 0.050 | 0.010 | 1 | 07/13/12 10:02 | 07/22/12 15:44 | 7440-23-5 | |
| Total Hardness by 2340B, Dissolved | **374** | mg/L | 0.71 | 0.36 | 10 | 07/13/12 10:02 | 07/22/12 15:48 | | |
| Vanadium, Dissolved | **0.037** | mg/L | 0.00010 | 0.000037 | 1 | 07/13/12 10:02 | 07/22/12 15:44 | 7440-62-2 | |
| Zinc, Dissolved | **0.079** | mg/L | 0.0050 | 0.0010 | 1 | 07/13/12 10:02 | 07/22/12 15:44 | 7440-66-6 | |
| **300.0 IC Anions** | Analytical Method: EPA 300.0 | | | | | | | | |
| Chloride | **3.7** | mg/L | 2.0 | 0.37 | 2 | | 07/16/12 11:30 | 16887-00-6 | |
| Sulfate | **193** | mg/L | 10.0 | 1.2 | 10 | | 07/16/12 06:35 | 14808-79-8 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B | | | | | | | | |
| Alkalinity,Bicarbonate (CaCO3) | **175** | mg/L | 5.0 | 2.5 | 1 | | 07/11/12 15:37 | | |
| Alkalinity, Carbonate (CaCO3) | **<2.5** | mg/L | 5.0 | 2.5 | 1 | | 07/11/12 15:37 | | |
| Alkalinity, Total as CaCO3 | **175** | mg/L | 5.0 | 2.5 | 1 | | 07/11/12 15:37 | | |
| **Cation/Anion Balance (Mining)** | Analytical Method: SM 1030E | | | | | | | | |
| Cation/Anion Balance | **0.78** | % | | | 1 | | 07/30/12 09:07 | | |
| Total Cations | **7.7** | meq/L | | | 1 | | 07/30/12 09:07 | | |
| Total Anions | **7.6** | meq/L | | | 1 | | 07/30/12 09:07 | | |



**REPORT OF LABORATORY ANALYSIS**

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## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10198100

QC Batch: MPRP/33661 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10198100001, 10198100002, 10198100003, 10198100004

METHOD BLANK: 1238410 Matrix: Water
Associated Lab Samples: 10198100001, 10198100002, 10198100003, 10198100004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Cadmium | mg/L | <0.000028 | 0.000080 | 07/20/12 23:02 | |
| Calcium | mg/L | <0.010 | 0.020 | 07/20/12 23:02 | |
| Chromium | mg/L | <0.000094 | 0.00050 | 07/20/12 23:02 | |
| Magnesium | mg/L | <0.0023 | 0.0050 | 07/20/12 23:02 | |
| Nickel | mg/L | <0.00015 | 0.00050 | 07/20/12 23:02 | |
| Potassium | mg/L | 0.012J | 0.020 | 07/20/12 23:02 | |
| Selenium | mg/L | <0.000094 | 0.00050 | 07/20/12 23:02 | |
| Sodium | mg/L | <0.010 | 0.050 | 07/20/12 23:02 | |
| Total Hardness by 2340B | mg/L | <0.036 | 0.071 | 07/20/12 23:02 | |
| Vanadium | mg/L | <0.000037 | 0.00010 | 07/20/12 23:02 | |
| Zinc | mg/L | <0.0010 | 0.0050 | 07/20/12 23:02 | |

LABORATORY CONTROL SAMPLE: 1238411

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Cadmium | mg/L | .08 | 0.081 | 101 | 85-115 | |
| Calcium | mg/L | 1 | 0.99 | 99 | 85-115 | |
| Chromium | mg/L | .08 | 0.082 | 102 | 85-115 | |
| Magnesium | mg/L | 1 | 1.0 | 102 | 85-115 | |
| Nickel | mg/L | .08 | 0.084 | 105 | 85-115 | |
| Potassium | mg/L | 1 | 0.96 | 96 | 85-115 | |
| Selenium | mg/L | .08 | 0.079 | 99 | 85-115 | |
| Sodium | mg/L | 1 | 0.97 | 97 | 85-115 | |
| Total Hardness by 2340B | mg/L | 6.6 | 6.7 | 101 | 85-115 | |
| Vanadium | mg/L | .08 | 0.080 | 100 | 85-115 | |
| Zinc | mg/L | .08 | 0.083 | 103 | 85-115 | |

MATRIX SPIKE SAMPLE: 1238412

| Parameter | Units | 10198100001 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Cadmium | mg/L | 0.00081 | .08 | 0.081 | 101 | 70-130 | |
| Calcium | mg/L | 103 | 1 | 104 | 80 | 70-130 | |
| Chromium | mg/L | 0.0056 | .08 | 0.087 | 102 | 70-130 | |
| Magnesium | mg/L | 23.1 | 1 | 24.0 | 92 | 70-130 | |
| Nickel | mg/L | 0.0090 | .08 | 0.092 | 104 | 70-130 | |
| Potassium | mg/L | 1.7 | 1 | 2.7 | 99 | 70-130 | |
| Selenium | mg/L | 1.8 | .08 | 1.9 | 109 | 70-130 | |
| Sodium | mg/L | 5.2 | 1 | 6.1 | 90 | 70-130 | |
| Total Hardness by 2340B | mg/L | 352 | 6.6 | 358 | 88 | 70-130 | |
| Vanadium | mg/L | 0.028 | .08 | 0.11 | 102 | 70-130 | |

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## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10198100

MATRIX SPIKE SAMPLE: 1238412

| Parameter | Units | 10198100001 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Zinc | mg/L | 0.024 | .08 | 0.11 | 106 | 70-130 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1238413 1238414

| Parameter | Units | 10198274005 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cadmium | mg/L | 0.0035 | .08 | .08 | 0.084 | 0.085 | 100 | 102 | 70-130 | 1 | 20 | |
| Calcium | mg/L | 357 | 1 | 1 | 364 | 354 | 760 | -325 | 70-130 | 3 | 20 | E,M1 |
| Chromium | mg/L | 0.00097 J | .08 | .08 | 0.084 | 0.083 | 104 | 102 | 70-130 | 1 | 20 | |
| Magnesium | mg/L | 172 | 1 | 1 | 178 | 172 | 645 | 60 | 70-130 | 3 | 20 | E,M1 |
| Nickel | mg/L | 0.070 | .08 | .08 | 0.16 | 0.16 | 106 | 109 | 70-130 | 1 | 20 | |
| Potassium | mg/L | 2.8 | 1 | 1 | 3.8 | 3.7 | 102 | 95 | 70-130 | 2 | 20 | |
| Selenium | mg/L | 0.43 | .08 | .08 | 0.52 | 0.52 | 112 | 111 | 70-130 | .3 | 20 | |
| Sodium | mg/L | 12.5 | 1 | 1 | 13.9 | 13.5 | 144 | 101 | 70-130 | 3 | 20 | M1 |
| Total Hardness by 2340B | mg/L | 160000 0 ug/L | 6.6 | 6.6 | 1640 | 1590 | 688 | -85 | 70-130 | 3 | 20 | |
| Vanadium | mg/L | 4.6J ug/L | .08 | .08 | 0.086 | 0.087 | 102 | 102 | 70-130 | .2 | 20 | |
| Zinc | mg/L | 0.13 | .08 | .08 | 0.21 | 0.21 | 108 | 109 | 70-130 | .4 | 20 | |



**REPORT OF LABORATORY ANALYSIS**

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## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10198100

QC Batch: MPRP/33655 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10198100001, 10198100002, 10198100003, 10198100004

METHOD BLANK: 1238381 Matrix: Water
Associated Lab Samples: 10198100001, 10198100002, 10198100003, 10198100004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | <0.000028 | 0.000080 | 07/22/12 14:26 | |
| Calcium, Dissolved | mg/L | 0.013J | 0.020 | 07/22/12 14:26 | |
| Chromium, Dissolved | mg/L | <0.000094 | 0.00050 | 07/22/12 14:26 | |
| Magnesium, Dissolved | mg/L | 0.0049J | 0.0050 | 07/22/12 14:26 | |
| Nickel, Dissolved | mg/L | <0.00015 | 0.00050 | 07/22/12 14:26 | |
| Potassium, Dissolved | mg/L | <0.0052 | 0.020 | 07/22/12 14:26 | |
| Selenium, Dissolved | mg/L | <0.000094 | 0.00050 | 07/22/12 14:26 | |
| Sodium, Dissolved | mg/L | <0.010 | 0.050 | 07/22/12 14:26 | |
| Total Hardness by 2340B, Dissolved | mg/L | 0.052J | 0.071 | 07/22/12 14:26 | |
| Vanadium, Dissolved | mg/L | <0.000037 | 0.00010 | 07/22/12 14:26 | |
| Zinc, Dissolved | mg/L | <0.0010 | 0.0050 | 07/22/12 14:26 | |

LABORATORY CONTROL SAMPLE: 1238382

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | .08 | 0.078 | 98 | 85-115 | |
| Calcium, Dissolved | mg/L | 1 | 0.93 | 93 | 85-115 | |
| Chromium, Dissolved | mg/L | .08 | 0.080 | 100 | 85-115 | |
| Magnesium, Dissolved | mg/L | 1 | 0.97 | 97 | 85-115 | |
| Nickel, Dissolved | mg/L | .08 | 0.080 | 100 | 85-115 | |
| Potassium, Dissolved | mg/L | 1 | 0.98 | 98 | 85-115 | |
| Selenium, Dissolved | mg/L | .08 | 0.082 | 102 | 85-115 | |
| Sodium, Dissolved | mg/L | 1 | 0.96 | 96 | 85-115 | |
| Total Hardness by 2340B, Dissolved | mg/L | 6.6 | 6.3 | 96 | 85-115 | |
| Vanadium, Dissolved | mg/L | .08 | 0.079 | 99 | 85-115 | |
| Zinc, Dissolved | mg/L | .08 | 0.080 | 100 | 85-115 | |

MATRIX SPIKE SAMPLE: 1238383

| Parameter | Units | 10198138001 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | ND | .08 | 0.078 | 98 | 70-130 | |
| Calcium, Dissolved | mg/L | 102000 ug/L | 1 | 119 | 1720 | 70-130 | E,M1 |
| Chromium, Dissolved | mg/L | 1.1 ug/L | .08 | 0.081 | 100 | 70-130 | |
| Magnesium, Dissolved | mg/L | 129000 ug/L | 1 | 148 | 1900 | 70-130 | E,M1 |
| Nickel, Dissolved | mg/L | ND | .08 | 0.080 | 100 | 70-130 | |
| Potassium, Dissolved | mg/L | 9050 ug/L | 1 | 10.3 | 122 | 70-130 | |
| Selenium, Dissolved | mg/L | 5.3 ug/L | .08 | 0.091 | 107 | 70-130 | |
| Sodium, Dissolved | mg/L | 94200 ug/L | 1 | 102 | 735 | 70-130 | M1 |

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## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10198100

MATRIX SPIKE SAMPLE: 1238383

| Parameter | Units | 10198138001 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Total Hardness by 2340B, Dissolved | mg/L | 784000 ug/L | 6.6 | 905 | 1830 | 70-130 | |
| Vanadium, Dissolved | mg/L | 0.32 ug/L | .08 | 0.082 | 103 | 70-130 | |
| Zinc, Dissolved | mg/L | 5.9 ug/L | .08 | 0.085 | 99 | 70-130 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1238384 1238385

| Parameter | Units | 10198274005 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | 0.0032 | .08 | .08 | 0.077 | 0.078 | 92 | 94 | 70-130 | 2 | 20 | |
| Calcium, Dissolved | mg/L | 367 | 1 | 1 | 360 | 368 | -695 | 25 | 70-130 | 2 | 20 | E,M1 |
| Chromium, Dissolved | mg/L | 0.00096 | .08 | .08 | 0.078 | 0.077 | 96 | 95 | 70-130 | .7 | 20 | |
| Magnesium, Dissolved | mg/L | 162 | 1 | 1 | 160 | 163 | -220 | 50 | 70-130 | 2 | 20 | E,M1 |
| Nickel, Dissolved | mg/L | 0.065 | .08 | .08 | 0.14 | 0.14 | 92 | 96 | 70-130 | 2 | 20 | |
| Potassium, Dissolved | mg/L | 3.0 | 1 | 1 | 3.9 | 3.9 | 89 | 94 | 70-130 | 1 | 20 | |
| Selenium, Dissolved | mg/L | 0.46 | .08 | .08 | 0.55 | 0.55 | 112 | 116 | 70-130 | .6 | 20 | |
| Sodium, Dissolved | mg/L | 12.2 | 1 | 1 | 13.2 | 13.5 | 94 | 124 | 70-130 | 2 | 20 | |
| Total Hardness by 2340B, Dissolved | mg/L | 1580 | 6.6 | 6.6 | 1560 | 1590 | -399 | 41 | 70-130 | 2 | 20 | |
| Vanadium, Dissolved | mg/L | 4.4J ug/L | .08 | .08 | 0.081 | 0.083 | 96 | 98 | 70-130 | 2 | 20 | |
| Zinc, Dissolved | mg/L | 0.12 | .08 | .08 | 0.20 | 0.20 | 100 | 101 | 70-130 | .4 | 20 | |

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## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10198100

QC Batch: MT/9411 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10198100001, 10198100002, 10198100003, 10198100004

METHOD BLANK: 1241173 Matrix: Water
Associated Lab Samples: 10198100001, 10198100002, 10198100003, 10198100004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Chloride | mg/L | <0.18 | 1.0 | 07/15/12 15:50 | |
| Sulfate | mg/L | <0.12 | 1.0 | 07/15/12 15:50 | |

METHOD BLANK: 1241210 Matrix: Water
Associated Lab Samples: 10198100001, 10198100002, 10198100003, 10198100004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Chloride | mg/L | <0.18 | 1.0 | 07/15/12 16:49 | 1M |
| Sulfate | mg/L | <0.12 | 1.0 | 07/15/12 16:49 | 1M |

LABORATORY CONTROL SAMPLE: 1241174

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 20 | 20.3 | 102 | 90-110 | E |
| Sulfate | mg/L | 20 | 19.4 | 97 | 90-110 | |

LABORATORY CONTROL SAMPLE: 1241211

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 20 | 20.4 | 102 | 90-110 | 1M,E |
| Sulfate | mg/L | 20 | 19.3 | 96 | 90-110 | 1M |

MATRIX SPIKE SAMPLE: 1241212

| Parameter | Units | 10197783002 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Chloride | mg/L | 3.4 | 50 | 60.2 | 114 | 80-120 | |
| Sulfate | mg/L | 2.4J | 50 | 53.6 | 102 | 80-120 | |

MATRIX SPIKE SAMPLE: 1241214

| Parameter | Units | 10197977001 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Chloride | mg/L | 3.5 | 10 | 13.4 | 98 | 80-120 | |
| Sulfate | mg/L | 2.6 | 10 | 12.0 | 93 | 80-120 | |

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## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10198100

SAMPLE DUPLICATE: 1241213

| Parameter | Units | 10197785003 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 2.3J | 2.1 | | 20 | |
| Sulfate | mg/L | 8.0 | 9.0 | 12 | 20 | |

SAMPLE DUPLICATE: 1241215

| Parameter | Units | 10197977002 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | <0.50 | 0.43J | | 20 | |
| Sulfate | mg/L | <0.50 | 0.35J | | 20 | |

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## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10198100

QC Batch: WET/26728 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10198100001, 10198100002, 10198100003, 10198100004

METHOD BLANK: 1237344 Matrix: Water
Associated Lab Samples: 10198100001, 10198100002, 10198100003, 10198100004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Alkalinity, Carbonate (CaCO3) | mg/L | <2.5 | 5.0 | 07/11/12 12:00 | |
| Alkalinity, Total as CaCO3 | mg/L | <2.5 | 5.0 | 07/11/12 12:00 | |
| Alkalinity,Bicarbonate (CaCO3) | mg/L | <2.5 | 5.0 | 07/11/12 12:00 | |

LABORATORY CONTROL SAMPLE & LCSD: 1237345 1237346

| Parameter | Units | Spike Conc. | LCS Result | LCSD Result | LCS % Rec | LCSD % Rec | % Rec Limits | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 40 | 41.5 | 41.2 | 104 | 103 | 90-110 | .7 | 30 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1237347 1237348

| Parameter | Units | 10197785003 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 163 | 40 | 40 | 204 | 203 | 102 | 100 | 80-120 | .3 | 30 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1237349 1237350

| Parameter | Units | 10198014006 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 254 | 40 | 40 | 293 | 291 | 96 | 91 | 80-120 | .7 | 30 | |



**REPORT OF LABORATORY ANALYSIS**

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# QUALIFIERS

Project: North Maybe Mine
Pace Project No.: 10198100

## DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## LABORATORIES

| | |
|---|---|
| PASI-M | Pace Analytical Services - Minneapolis |
| PASI-MT | Pace Analytical Services - Montana |

## ANALYTE QUALIFIERS

| | |
|---|---|
| 1M | Centrifuged prior to analysis. |
| 2M | Sample was centrifuged due to particulate contamination. |
| B | Analyte was detected in the associated method blank. |
| E | Analyte concentration exceeded the calibration range. The reported result is estimated. |
| M1 | Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery. |

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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: North Maybe Mine
Pace Project No.: 10198100

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **10198100001** | **IA1-30A-070512** | EPA 200.8 | MPRP/33661 | EPA 200.8 | ICPM/13208 |
| **10198100002** | **IA1-28A-070512** | EPA 200.8 | MPRP/33661 | EPA 200.8 | ICPM/13208 |
| **10198100003** | **IA1-55-070512** | EPA 200.8 | MPRP/33661 | EPA 200.8 | ICPM/13208 |
| **10198100004** | **DUP-070512-A** | EPA 200.8 | MPRP/33661 | EPA 200.8 | ICPM/13208 |
| **10198100001** | **IA1-30A-070512** | EPA 200.8 | MPRP/33655 | EPA 200.8 | ICPM/13215 |
| **10198100002** | **IA1-28A-070512** | EPA 200.8 | MPRP/33655 | EPA 200.8 | ICPM/13215 |
| **10198100003** | **IA1-55-070512** | EPA 200.8 | MPRP/33655 | EPA 200.8 | ICPM/13215 |
| **10198100004** | **DUP-070512-A** | EPA 200.8 | MPRP/33655 | EPA 200.8 | ICPM/13215 |
| **10198100001** | **IA1-30A-070512** | EPA 300.0 | MT/9411 | | |
| **10198100002** | **IA1-28A-070512** | EPA 300.0 | MT/9411 | | |
| **10198100003** | **IA1-55-070512** | EPA 300.0 | MT/9411 | | |
| **10198100004** | **DUP-070512-A** | EPA 300.0 | MT/9411 | | |
| **10198100001** | **IA1-30A-070512** | SM 2320B | WET/26728 | | |
| **10198100002** | **IA1-28A-070512** | SM 2320B | WET/26728 | | |
| **10198100003** | **IA1-55-070512** | SM 2320B | WET/26728 | | |
| **10198100004** | **DUP-070512-A** | SM 2320B | WET/26728 | | |
| **10198100001** | **IA1-30A-070512** | SM 1030E | WETA/12975 | | |
| **10198100002** | **IA1-28A-070512** | SM 1030E | WETA/12975 | | |
| **10198100003** | **IA1-55-070512** | SM 1030E | WETA/12975 | | |
| **10198100004** | **DUP-070512-A** | SM 1030E | WETA/12975 | | |

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SHORT HOLD 7/12/12

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10198100

Page: 1 of 1

**Section A** Required Client Information:

| | |
|---|---|
| Company: | Agrium/Nu-West |
| Address: | 3010 Conda Rd |
| | Soda Springs, ID. 83276 |
| Email To: | Mitchell.Hart@agrium.com |
| Phone: 208-547-3935 | Fax |
| Requested Due Date/TAT: | 7-10 Business Days |

**Section B** Required Project Information:

| | |
|---|---|
| Report To: | James.Williams@agrium.com |
| Copy To: | Julie.Lincoln@aecom.com |
| Purchase Order No.: | 4800058265 |
| Project Name: | North Maybe Mine |
| Project Number: | |

**Section C** Invoice Information:

| | |
|---|---|
| Attention: | Accounts Payable |
| Company Name: | Nu-West Industries, Inc. |
| Address: | Calgary, Alberta, Canada T2H 3B9 |
| Pace Quote Reference: | Nor_040612_NMM SW- J |
| Pace Project Manager: | Sally Heinje |
| Pace Profile #: | |

**REGULATORY AGENCY**

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: ID

**Section D** Required Client Information

**SAMPLE ID**
(A-Z, 0-9 / , -)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

| MATRIX | CODE |
|---|---|
| DRINKING WATER | DW |
| WATER | WT |
| WASTE WATER | WW |
| PRODUCT | P |
| SOIL/SOLID | SL |
| OIL | OL |
| WIPE | WP |
| AIR | AR |
| OTHER | OT |
| TISSUE | TS |

| ITEM # | SAMPLE ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED COMPOSITE START DATE | COLLECTED COMPOSITE START ~~TIME~~ | COLLECTED COMPOSITE END/GRAB ~~DATE~~ TIME | COLLECTED COMPOSITE END/GRAB ~~TIME~~ | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Analysis Test Y/N | Table 4-2 (enclosed) | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | IA1-30A-070512 | WT | G | 07/05/12 | 1045 | | | | 4 | ✓ | | ✓ | | | | | | X | X | | 10198100001 |
| 2 | IA1-28A-070512 | WT | G | 07/05/12 | 1055 | | | | 4 | ✓ | | ✓ | | | | | | X | X | | 002 |
| 3 | IA1-55-070512 | WT | G | 07/05/12 | 1115 | | | | 4 | ✓ | | ✓ | | | | | | X | X | | 003 |
| 4 | DUP-070512-A | WT | G | 07/05/12 | 1130 | | | | 4 | ✓ | | ✓ | | | | | | X | X | | 004 |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS: Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N) |
|---|---|---|---|---|---|---|---|---|---|---|
| cooler id # 104873 | James B. Williams | 07/09/12 | 0800 | [illegible] Pace | 7/10/12 | 1013 | 4.1 | Y | Y | Y |
| Level III data package | | | | | | | | | | |

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: James B. Williams

SIGNATURE of SAMPLER: James B. Williams DATE Signed (MM/DD/YY): 07/05/12

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

## Table 4-2 Surface water Analyte List for July

| Analyte | Analytical Method | Container Size | | Container Material | Preservative | Holding Time | Detection Limit/Units |
|---|---|---|---|---|---|---|---|
| | | Total | Dissolved | | | | |
| Cadmium – total & dissolved* | EPA M200.8 | 250 ml | 250 ml* | Polyethylene | Nitric Acid | 180 Days | 0.1 µg/L |
| Chromium – total & dissolved* | EPA M200.8 | | | | | | 0.1 µg/L |
| Nickel – total & dissolved* | EPA M200.8 | | | | | | 0.6 µg/L |
| Selenium – total & dissolved* | EPA M200.8 | | | | | | 0.1 µg/L |
| Vanadium – total & dissolved* | EPA M200.8 | | | | | | 0.2 µg/L |
| Zinc – total & dissolved* | EPA M200.8 | | | | | | 2 µg/L |
| Cations – Calcium – total & dissolved* | EPA M200.7 | | | | | | 0.2 mg/L |
| Cations – Magnesium – total & dissolved* | EPA M200.7 | | | | | | 0.2 mg/L |
| Cations – Potassium – total & dissolved* | EPA M200.7 | | | | | | 0.3 mg/L |
| Cations – Sodium – total & dissolved* | EPA M200.7 | | | | | | 0.3 mg/L |
| Alkalinity, bicarbonate (as CaCO3) | SM 2320B | 1000 ml | - | Polyethylene | Cool to 4°C ± 2°C | 14 Days | 2 mg/L |
| Alkalinity, carbonate (as CaCO3) | SM 2320B | | | | | | |
| Alkalinity, total (as CaCO3) | SM 2320B | | | | | | |
| Anions - Chloride | EPA M300.0 | | | | | 28 Days | 0.5 mg/L |
| Anions - Sulfate | EPA M300.0 | | | | | | 0.5 mg/L |
| Hardness | SM 2340B (Calculated) | - | - | Polyethylene | Nitric Acid | 180 Days | 2 mg/L |
| pH | Field | - | - | - | - | Analyze immediately | standard units |
| ORP | Field | - | - | - | - | | mV |
| Dissolved Oxygen | Field | - | - | - | - | | mg/L |
| Conductivity | Field | - | - | - | - | | µmhos/cm |
| Temperature | Field | - | - | - | - | | °C |
| Turbidity | Field | - | - | - | - | | NTU |

* Sample for dissolved analysis will be field filtered using a disposable 0.45 micron filter prior to preservation
ml = milliliters
µg/L = micrograms per liter
mg/L = milligrams per liter
mV = millivolts
µmhos/cm = micromhos per centimeter
°C = degrees Celsius
NTU = nephelometric turbidity units

| Pace Analytical | Document Name: Sample Condition Upon Receipt Form | Document Revised: 19Jun2012 Page 1 of 1 |
|---|---|---|
| | Document No.: F-MN-L-213-rev.03 | Issuing Authority: Pace Minnesota Quality Office |

**Sample Condition Upon Receipt**

**Client Name:** Agrium

**Project #:** WO# : 10198100

10198100

**Courier:** ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other:

**Tracking Number:** 4569 1404 7974

**Custody Seal on Cooler/Box Present?** ☒ Yes ☐ No **Seals Intact?** ☒ Yes ☐ No

**Optional:** Proj. Due Date: Proj. Name:

**Packing Material:** ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☒ Yes ☐ No

**Thermometer Used:** ☐ 80344042 ☒ 80512447 **Type of Ice:** ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

**Cooler Temperature:** 4.1 **Biological Tissue Frozen?** ☐ Yes ☐ No **Date and Initials of Person Examining Contents:** 9/10/12

Temp should be above freezing to 6°C

| | | | | Comments: |
|---|---|---|---|---|
| Chain of Custody Present? | ☒ Yes | ☐ No | ☐ N/A | 1. |
| Chain of Custody Filled Out? | ☒ Yes | ☐ No | ☐ N/A | 2. |
| Chain of Custody Relinquished? | ☒ Yes | ☐ No | ☐ N/A | 3. |
| Sampler Name and Signature on COC? | ☒ Yes | ☐ No | ☐ N/A | 4. |
| Samples Arrived within Hold Time? | ☒ Yes | ☐ No | ☐ N/A | 5. |
| Short Hold Time Analysis (<72 hr)? | ☒ Yes | ☐ No | ☐ N/A | 6. turb |
| Rush Turn Around Time Requested? | ☐ Yes | ☒ No | ☐ N/A | 7. |
| Sufficient Volume? | ☒ Yes | ☐ No | ☐ N/A | 8. |
| Correct Containers Used? | ☒ Yes | ☐ No | ☐ N/A | 9. |
| -Pace Containers Used? | ☒ Yes | ☐ No | ☐ N/A | |
| Containers Intact? | ☒ Yes | ☐ No | ☐ N/A | 10. |
| Filtered Volume Received for Dissolved Tests? | ☒ Yes | ☐ No | ☐ N/A | 11. |
| Sample Labels Match COC? | ☒ Yes | ☐ No | ☐ N/A | 12. |
| -Includes Date/Time/ID/Analysis Matrix: wt | | | | |
| All containers needing acid/base preservation have been checked? Noncompliances are noted in 13. | ☒ Yes | ☐ No | ☐ N/A | 13. ☒ $HNO_3$ ☐ $H_2SO_4$ ☐ NaOH ☐ HCl |
| All containers needing preservation are found to be in compliance with EPA recommendation? ($HNO_3$, $H_2SO_4$, HCl<2; NaOH>12) | ☒ Yes | ☐ No | ☐ N/A | Sample # 2/2 |
| Exceptions: VOA, Coliform, TOC, Oil and Grease, WI-DRO (water) | ☐ Yes | ☒ No | | 1A1 30A, 28A, 55, 2N8 |
| | | | | Initial when completed: Lot # of added preservative: |
| Headspace in VOA Vials (>6mm)? | ☐ Yes | ☐ No | ☒ N/A | 14. |
| Trip Blank Present? | ☐ Yes | ☐ No | ☒ N/A | 15. |
| Trip Blank Custody Seals Present? | ☐ Yes | ☐ No | ☐ N/A | |
| Pace Trip Blank Lot # (if purchased): | | | | |

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

**Project Manager Review:** **Date:**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

| Pace Analytical™ | Document Name: MT/MN Sample Transfer Form | Revised Date: 1Aug2011 Page 1 of 1 |
|---|---|---|
| | Document Number: F-MT-179-Rev.00 | Issuing Authority: Pace Montana Quality Office |

| | |
|---|---|
| Shipping Tracking # UPS Fed Ex | 456914053580 |
| Client | Agrium |
| Due Date | 7/20/2012 |
| Pace WO | 10198100 |

# MT/MN Sample Transfer Condition Upon Receipt Form

## ANALYSIS REQUESTED

| Method Number & Description | Container Type | # of Bottles | Number of Samples | Preservative Yes__ No__ | Verify Arrival Date & Initials |
|---|---|---|---|---|---|
| 300 Anions | BP3U | 4 | 4 | no | NCT 7/11/12 |

## REPORTING REQUIREMENTS/ADDITIONAL COMMENTS

## MONTANA SAMPLE RECEIPT INFORMATION

| | | | |
|---|---|---|---|
| Cooler Temperature: 1383045 | 3.0 | Sample Matrix: | $H_2O$ |
| Arrived on Ice: | Yes X No__ | Filtred volume rec'd for dissolved tests: | Yes__ No__ NA X |
| Custody Seal Present: | Yes X No__ | Samples pH have been checked: | Yes__ No__ NA X |
| Short Hold Time Requested < 72 Hours: | Yes__ No X | Trip Blank Present: | Yes__ No__ NA X |
| Rush TAT Requested: | Yes__ No X | Trip Blank Custody Seals Present: | Yes__ No__ NA X |
| Sufficient Sample Volume: | Yes X No__ | Pace Trip Blank Lot #: | NA |
| Samples Arrived within Hold Time: | Yes X No__ | Sample Composites Required: | Yes__ No__ NA X |
| Containers Intact: | Yes X No__ | Report Samples: | Wet Wt.__ Dry Wt.__ |
| | | Reporting Units: | NA |

## CUSTODY TRANSFER

| Relinquished by/Affiliation | Date | Time | Accepted By Affiliation | Date | Time |
|---|---|---|---|---|---|
| Cassy Sparks Pace MT Fedex | 7/10/12 | 1:20 | | | |
| | 7/11/12 | 1003 | Norma C. Trankle/Pace | 7/11/12 | 1003 |

# DATA VALIDATION REPORT

| | |
|---|---|
| Company: | AECOM Environment |
| Project Name: | Agrium, Inc. |
| Laboratory: | Pace Analytical Services, Inc. |
| Pace Project ID: | 10201585 |
| Data Validator: | Chris Davis |
| Date Validated: | December 6, 2012 |
| Reviewer: | Julie Lincoln |
| Date Reviewed: | December 7, 2012 |
| Sample Media: | Surface Water |
| Analytical Parameters and Methods: | 1. Total and Dissolved Metals (cadmium, chromium, nickel, selenium, vanadium, and zinc); 200.8<br>2. Dissolved Cations (calcium, magnesium); 200.8<br>3. Hardness; SM2340B |
| Sample Identifications: | IA1-30A-080612<br>IA1-28A-080612<br>IA1-55-080612<br>DUP-080612-A (field duplicate for IA1-30A-080612) |

## 1. PRESERVATION AND HOLDING TIMES

Preservation: Acceptable.

Holding Time: Acceptable.

## 2. BLANKS

Non-detected, except laboratory reagent blanks (LRBs) at the following maximum concentrations in the specified batches for:

Dissolved magnesium at 0.0030 mg/L (LRB MPRP/345108)

Dissolved zinc at 0.0011 mg/L (LRB MPRP/34510)

**Qualification:** No qualification was necessary. All sample results were greater than 10-times the concentrations in the associated blanks.

## 3. LABORATORY CONTROL SAMPLES

Acceptable.

## 4. DUPLICATE ANALYSES

Acceptable.

## 5. SPIKE SAMPLE ANALYSES

Acceptable. Note that the percent recoveries (%Rs) of 825% and 310% for dissolved calcium in the MS/MSD, 48% for dissolved magnesium in the MSD, 166% for dissolved selenium in the MS, and 144% and 129% for total selenium in the MS/MSD analyses of sample IA1-30A-080612 (10201585-001); and the 410% for dissolved calcium in the MS, 56% for dissolved magnesium in the MS, and 54% for dissolved selenium in the MS analysis of sample IA1-55-080612 (10201585-003) exceeded the 75-125%R control limits for metals. For sample results that exceed four-times the concentration of the spike, spike recovery limits do not apply and the data are not considered to exceed acceptance criteria, even if the %Rs do not meet the specified control limits, as specified in the Functional Guidelines. As the sample results exceeded four times the spike, no qualifiers are applicable.

## 6. OVERALL ASSESSMENT

No other issues were identified.

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December 10, 2012

Mitchell Hart
Nu-West Industries, Inc
3010 Conda Road
Soda Springs, ID 83276

RE: Project: Revised: North Maybe Mine
Pace Project No.: 10201585

Dear Mitchell Hart:
Enclosed are the analytical results for sample(s) received by the laboratory on August 08, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Revised: This report was revised on 9/7/12 to include re-analysis results of Selenium on all samples.

Revised: This report was revised on 12/10/12 to include Ca and Mg results for sample 1.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Cindy Emmons, Norwest Corporation
Julie Lincoln, AECOM
James Williams, Agrium

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## CERTIFICATIONS

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

**Minnesota Certification IDs**
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Hawaii Certification #Pace
Idaho Certification #: MN00064
Illinois Certification #: 200011
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia/DCLS Certification #: 002521
Virginia/VELAP Certification #: 460163
Washington Certification #: C754
West Virginia Certification #: 382
Wisconsin Certification #: 999407970

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## SAMPLE SUMMARY

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| 10201585001 | IA1-30A-080612 | Water | 08/06/12 11:35 | 08/08/12 09:55 |
| 10201585002 | IA1-28A-080612 | Water | 08/06/12 11:50 | 08/08/12 09:55 |
| 10201585003 | IA1-55-080612 | Water | 08/06/12 12:05 | 08/08/12 09:55 |
| 10201585004 | DUP-080612-A | Water | 08/06/12 11:00 | 08/08/12 09:55 |

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## SAMPLE ANALYTE COUNT

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| 10201585001 | IA1-30A-080612 | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |
| 10201585002 | IA1-28A-080612 | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |
| 10201585003 | IA1-55-080612 | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |
| 10201585004 | DUP-080612-A | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |

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## PROJECT NARRATIVE

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

**Method:** **EPA 200.8**
**Description:** 200.8 MET ICPMS
**Client:** Agrium- Nu-West
**Date:** December 10, 2012

**General Information:**
4 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: MPRP/34582

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1267821)
  - Selenium
- MSD (Lab ID: 1267822)
  - Selenium

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## PROJECT NARRATIVE

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

**Method:** **EPA 200.8**
**Description:** 200.8 MET ICPMS, Dissolved
**Client:** Agrium- Nu-West
**Date:** December 10, 2012

**General Information:**
4 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

B: Analyte was detected in the associated method blank.
- DUP-080612-A (Lab ID: 10201585004)
- IA1-28A-080612 (Lab ID: 10201585002)
- IA1-30A-080612 (Lab ID: 10201585001)
- IA1-55-080612 (Lab ID: 10201585003)

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/34510

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10201585001,10201585003

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- MS (Lab ID: 1265872)
  - Calcium, Dissolved
  - Magnesium, Dissolved
  - Selenium, Dissolved
- MS (Lab ID: 1267499)
  - Calcium, Dissolved
  - Selenium, Dissolved
- MSD (Lab ID: 1267500)

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## PROJECT NARRATIVE

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

**Method:** **EPA 200.8**
**Description:** 200.8 MET ICPMS, Dissolved
**Client:** Agrium- Nu-West
**Date:** December 10, 2012

QC Batch: MPRP/34510

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10201585001,10201585003

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- Calcium, Dissolved
- Magnesium, Dissolved

**Additional Comments:**

Analyte Comments:

QC Batch: MPRP/34510

B: Analyte was detected in the associated method blank.

- DUP-080612-A (Lab ID: 10201585004)
  - Magnesium, Dissolved
  - Zinc, Dissolved
- IA1-28A-080612 (Lab ID: 10201585002)
  - Magnesium, Dissolved
  - Zinc, Dissolved
- IA1-30A-080612 (Lab ID: 10201585001)
  - Magnesium, Dissolved
  - Zinc, Dissolved
- IA1-55-080612 (Lab ID: 10201585003)
  - Magnesium, Dissolved
  - Zinc, Dissolved

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1265872)
  - Calcium, Dissolved
- MS (Lab ID: 1267499)
  - Calcium, Dissolved
- MSD (Lab ID: 1267500)
  - Calcium, Dissolved

This data package has been reviewed for quality and completeness and is approved for release.

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## ANALYTICAL RESULTS

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

**Sample: IA1-30A-080612** **Lab ID: 10201585001** Collected: 08/06/12 11:35 Received: 08/08/12 09:55 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.00055** | mg/L | 0.000080 | 0.000028 | 1 | 08/15/12 15:30 | 08/17/12 03:57 | 7440-43-9 | |
| Chromium | **0.0056** | mg/L | 0.00050 | 0.000094 | 1 | 08/15/12 15:30 | 08/17/12 03:57 | 7440-47-3 | |
| Nickel | **0.0078** | mg/L | 0.00050 | 0.00015 | 1 | 08/15/12 15:30 | 08/17/12 03:57 | 7440-02-0 | |
| Selenium | **1.7** | mg/L | 0.0025 | 0.00047 | 5 | 08/15/12 15:30 | 08/25/12 07:56 | 7782-49-2 | |
| Vanadium | **0.022** | mg/L | 0.00010 | 0.000037 | 1 | 08/15/12 15:30 | 08/17/12 03:57 | 7440-62-2 | |
| Zinc | **0.018** | mg/L | 0.0050 | 0.0010 | 1 | 08/15/12 15:30 | 08/17/12 03:57 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.00056** | mg/L | 0.000080 | 0.000028 | 1 | 08/15/12 12:07 | 08/17/12 19:45 | 7440-43-9 | |
| Calcium, Dissolved | **114** | mg/L | 0.20 | 0.10 | 10 | 08/15/12 12:07 | 08/20/12 13:38 | 7440-70-2 | M1 |
| Chromium, Dissolved | **0.0050** | mg/L | 0.00050 | 0.000094 | 1 | 08/15/12 12:07 | 08/17/12 19:45 | 7440-47-3 | |
| Magnesium, Dissolved | **25.6** | mg/L | 0.025 | 0.012 | 5 | 08/15/12 12:07 | 08/17/12 19:59 | 7439-95-4 | B,M1 |
| Nickel, Dissolved | **0.0079** | mg/L | 0.00050 | 0.00015 | 1 | 08/15/12 12:07 | 08/17/12 19:45 | 7440-02-0 | |
| Selenium, Dissolved | **1.8** | mg/L | 0.0025 | 0.00047 | 5 | 08/15/12 12:07 | 08/17/12 19:59 | 7782-49-2 | M1 |
| Total Hardness by 2340B, Dissolved | **391** | mg/L | 0.71 | 0.36 | 10 | 08/15/12 12:07 | 08/20/12 13:38 | | |
| Vanadium, Dissolved | **0.022** | mg/L | 0.00010 | 0.000037 | 1 | 08/15/12 12:07 | 08/17/12 19:45 | 7440-62-2 | |
| Zinc, Dissolved | **0.020** | mg/L | 0.0050 | 0.0010 | 1 | 08/15/12 12:07 | 08/17/12 19:45 | 7440-66-6 | B |

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## ANALYTICAL RESULTS

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

**Sample: IA1-28A-080612** **Lab ID: 10201585002** Collected: 08/06/12 11:50 Received: 08/08/12 09:55 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0011** | mg/L | 0.000080 | 0.000028 | 1 | 08/15/12 15:30 | 08/17/12 04:25 | 7440-43-9 | |
| Chromium | **0.0051** | mg/L | 0.00050 | 0.000094 | 1 | 08/15/12 15:30 | 08/17/12 04:25 | 7440-47-3 | |
| Nickel | **0.016** | mg/L | 0.00050 | 0.00015 | 1 | 08/15/12 15:30 | 08/17/12 04:25 | 7440-02-0 | |
| Selenium | **1.7** | mg/L | 0.0025 | 0.00047 | 5 | 08/15/12 15:30 | 08/25/12 08:01 | 7782-49-2 | |
| Vanadium | **0.035** | mg/L | 0.00010 | 0.000037 | 1 | 08/15/12 15:30 | 08/17/12 04:25 | 7440-62-2 | |
| Zinc | **0.039** | mg/L | 0.0050 | 0.0010 | 1 | 08/15/12 15:30 | 08/17/12 04:25 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.00064** | mg/L | 0.000080 | 0.000028 | 1 | 08/15/12 12:07 | 08/17/12 20:33 | 7440-43-9 | |
| Calcium, Dissolved | **111** | mg/L | 0.20 | 0.10 | 10 | 08/15/12 12:07 | 08/20/12 13:47 | 7440-70-2 | |
| Chromium, Dissolved | **0.0055** | mg/L | 0.00050 | 0.000094 | 1 | 08/15/12 12:07 | 08/17/12 20:33 | 7440-47-3 | |
| Magnesium, Dissolved | **25.5** | mg/L | 0.050 | 0.023 | 10 | 08/15/12 12:07 | 08/20/12 13:47 | 7439-95-4 | B |
| Nickel, Dissolved | **0.016** | mg/L | 0.00050 | 0.00015 | 1 | 08/15/12 12:07 | 08/17/12 20:33 | 7440-02-0 | |
| Selenium, Dissolved | **1.9** | mg/L | 0.0050 | 0.00094 | 10 | 08/15/12 12:07 | 08/20/12 13:47 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **382** | mg/L | 0.71 | 0.36 | 10 | 08/15/12 12:07 | 08/20/12 13:47 | | |
| Vanadium, Dissolved | **0.036** | mg/L | 0.00010 | 0.000037 | 1 | 08/15/12 12:07 | 08/17/12 20:33 | 7440-62-2 | |
| Zinc, Dissolved | **0.027** | mg/L | 0.0050 | 0.0010 | 1 | 08/15/12 12:07 | 08/17/12 20:33 | 7440-66-6 | B |

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## ANALYTICAL RESULTS

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

**Sample: IA1-55-080612** **Lab ID: 10201585003** Collected: 08/06/12 12:05 Received: 08/08/12 09:55 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0019** | mg/L | 0.000080 | 0.000028 | 1 | 08/15/12 15:30 | 08/17/12 04:30 | 7440-43-9 | |
| Chromium | **0.0054** | mg/L | 0.00050 | 0.000094 | 1 | 08/15/12 15:30 | 08/17/12 04:30 | 7440-47-3 | |
| Nickel | **0.018** | mg/L | 0.00050 | 0.00015 | 1 | 08/15/12 15:30 | 08/17/12 04:30 | 7440-02-0 | |
| Selenium | **2.1** | mg/L | 0.0025 | 0.00047 | 5 | 08/15/12 15:30 | 08/25/12 08:05 | 7782-49-2 | |
| Vanadium | **0.035** | mg/L | 0.00010 | 0.000037 | 1 | 08/15/12 15:30 | 08/17/12 04:30 | 7440-62-2 | |
| Zinc | **0.077** | mg/L | 0.0050 | 0.0010 | 1 | 08/15/12 15:30 | 08/17/12 04:30 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0021** | mg/L | 0.000080 | 0.000028 | 1 | 08/15/12 12:07 | 08/17/12 20:47 | 7440-43-9 | |
| Calcium, Dissolved | **122** | mg/L | 0.20 | 0.10 | 10 | 08/15/12 12:07 | 08/20/12 14:02 | 7440-70-2 | M1 |
| Chromium, Dissolved | **0.0055** | mg/L | 0.00050 | 0.000094 | 1 | 08/15/12 12:07 | 08/17/12 20:47 | 7440-47-3 | |
| Magnesium, Dissolved | **26.0** | mg/L | 0.025 | 0.012 | 5 | 08/15/12 12:07 | 08/17/12 20:57 | 7439-95-4 | B,M1 |
| Nickel, Dissolved | **0.019** | mg/L | 0.00050 | 0.00015 | 1 | 08/15/12 12:07 | 08/17/12 20:47 | 7440-02-0 | |
| Selenium, Dissolved | **1.9** | mg/L | 0.0025 | 0.00047 | 5 | 08/15/12 12:07 | 08/17/12 20:57 | 7782-49-2 | M1 |
| Total Hardness by 2340B, Dissolved | **413** | mg/L | 0.71 | 0.36 | 10 | 08/15/12 12:07 | 08/20/12 14:02 | | |
| Vanadium, Dissolved | **0.035** | mg/L | 0.00010 | 0.000037 | 1 | 08/15/12 12:07 | 08/17/12 20:47 | 7440-62-2 | |
| Zinc, Dissolved | **0.082** | mg/L | 0.0050 | 0.0010 | 1 | 08/15/12 12:07 | 08/17/12 20:47 | 7440-66-6 | B |

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## ANALYTICAL RESULTS

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

**Sample: DUP-080612-A** **Lab ID: 10201585004** Collected: 08/06/12 11:00 Received: 08/08/12 09:55 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.00061** | mg/L | 0.000080 | 0.000028 | 1 | 08/15/12 15:30 | 08/17/12 04:34 | 7440-43-9 | |
| Chromium | **0.0047** | mg/L | 0.00050 | 0.000094 | 1 | 08/15/12 15:30 | 08/17/12 04:34 | 7440-47-3 | |
| Nickel | **0.0078** | mg/L | 0.00050 | 0.00015 | 1 | 08/15/12 15:30 | 08/17/12 04:34 | 7440-02-0 | |
| Selenium | **2.1** | mg/L | 0.0025 | 0.00047 | 5 | 08/15/12 15:30 | 08/25/12 08:10 | 7782-49-2 | |
| Vanadium | **0.022** | mg/L | 0.00010 | 0.000037 | 1 | 08/15/12 15:30 | 08/17/12 04:34 | 7440-62-2 | |
| Zinc | **0.019** | mg/L | 0.0050 | 0.0010 | 1 | 08/15/12 15:30 | 08/17/12 04:34 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.00058** | mg/L | 0.000080 | 0.000028 | 1 | 08/15/12 12:07 | 08/17/12 20:37 | 7440-43-9 | |
| Calcium, Dissolved | **113** | mg/L | 0.20 | 0.10 | 10 | 08/15/12 12:07 | 08/20/12 14:07 | 7440-70-2 | |
| Chromium, Dissolved | **0.0049** | mg/L | 0.00050 | 0.000094 | 1 | 08/15/12 12:07 | 08/17/12 20:37 | 7440-47-3 | |
| Magnesium, Dissolved | **24.4** | mg/L | 0.050 | 0.023 | 10 | 08/15/12 12:07 | 08/20/12 14:07 | 7439-95-4 | B |
| Nickel, Dissolved | **0.0080** | mg/L | 0.00050 | 0.00015 | 1 | 08/15/12 12:07 | 08/17/12 20:37 | 7440-02-0 | |
| Selenium, Dissolved | **1.8** | mg/L | 0.0050 | 0.00094 | 10 | 08/15/12 12:07 | 08/20/12 14:07 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **383** | mg/L | 0.71 | 0.36 | 10 | 08/15/12 12:07 | 08/20/12 14:07 | | |
| Vanadium, Dissolved | **0.022** | mg/L | 0.00010 | 0.000037 | 1 | 08/15/12 12:07 | 08/17/12 20:37 | 7440-62-2 | |
| Zinc, Dissolved | **0.019** | mg/L | 0.0050 | 0.0010 | 1 | 08/15/12 12:07 | 08/17/12 20:37 | 7440-66-6 | B |

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## QUALITY CONTROL DATA

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

QC Batch: MPRP/34582 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10201585001, 10201585002, 10201585003, 10201585004

METHOD BLANK: 1267819 Matrix: Water
Associated Lab Samples: 10201585001, 10201585002, 10201585003, 10201585004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Cadmium | mg/L | <0.000028 | 0.000080 | 08/17/12 03:29 | |
| Chromium | mg/L | <0.000094 | 0.00050 | 08/17/12 03:29 | |
| Nickel | mg/L | <0.00015 | 0.00050 | 08/17/12 03:29 | |
| Selenium | mg/L | <0.000094 | 0.00050 | 08/17/12 03:29 | |
| Vanadium | mg/L | <0.000037 | 0.00010 | 08/17/12 03:29 | |
| Zinc | mg/L | <0.0010 | 0.0050 | 08/17/12 03:29 | |

LABORATORY CONTROL SAMPLE: 1267820

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Cadmium | mg/L | .08 | 0.077 | 96 | 85-115 | |
| Chromium | mg/L | .08 | 0.077 | 96 | 85-115 | |
| Nickel | mg/L | .08 | 0.078 | 98 | 85-115 | |
| Selenium | mg/L | .08 | 0.074 | 93 | 85-115 | |
| Vanadium | mg/L | .08 | 0.078 | 97 | 85-115 | |
| Zinc | mg/L | .08 | 0.078 | 98 | 85-115 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1267821 1267822

| Parameter | Units | 10201585001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cadmium | mg/L | 0.00055 | .08 | .08 | 0.078 | 0.078 | 96 | 97 | 70-130 | .9 | 20 | |
| Chromium | mg/L | 0.0056 | .08 | .08 | 0.082 | 0.081 | 95 | 95 | 70-130 | .3 | 20 | |
| Nickel | mg/L | 0.0078 | .08 | .08 | 0.086 | 0.086 | 98 | 98 | 70-130 | .2 | 20 | |
| Selenium | mg/L | 1.7 | .08 | .08 | 1.8 | 1.8 | 144 | 129 | 70-130 | .7 | 20 | E |
| Vanadium | mg/L | 0.022 | .08 | .08 | 0.10 | 0.099 | 98 | 96 | 70-130 | 1 | 20 | |
| Zinc | mg/L | 0.018 | .08 | .08 | 0.097 | 0.097 | 99 | 99 | 70-130 | .2 | 20 | |

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## QUALITY CONTROL DATA

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

QC Batch: MPRP/34510 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10201585001, 10201585002, 10201585003, 10201585004

METHOD BLANK: 1265868 Matrix: Water
Associated Lab Samples: 10201585001, 10201585002, 10201585003, 10201585004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | <0.000028 | 0.000080 | 08/17/12 19:16 | |
| Calcium, Dissolved | mg/L | <0.010 | 0.020 | 08/17/12 19:16 | |
| Chromium, Dissolved | mg/L | <0.000094 | 0.00050 | 08/17/12 19:16 | |
| Magnesium, Dissolved | mg/L | 0.0030J | 0.0050 | 08/17/12 19:16 | |
| Nickel, Dissolved | mg/L | <0.00015 | 0.00050 | 08/17/12 19:16 | |
| Selenium, Dissolved | mg/L | <0.000094 | 0.00050 | 08/17/12 19:16 | |
| Total Hardness by 2340B, Dissolved | mg/L | <0.036 | 0.071 | 08/17/12 19:16 | |
| Vanadium, Dissolved | mg/L | <0.000037 | 0.00010 | 08/17/12 19:16 | |
| Zinc, Dissolved | mg/L | 0.0011J | 0.0050 | 08/17/12 19:16 | |

LABORATORY CONTROL SAMPLE: 1265869

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | .08 | 0.084 | 105 | 85-115 | |
| Calcium, Dissolved | mg/L | 1 | 1.1 | 107 | 85-115 | |
| Chromium, Dissolved | mg/L | .08 | 0.081 | 101 | 85-115 | |
| Magnesium, Dissolved | mg/L | 1 | 1.1 | 106 | 85-115 | |
| Nickel, Dissolved | mg/L | .08 | 0.086 | 108 | 85-115 | |
| Selenium, Dissolved | mg/L | .08 | 0.079 | 99 | 85-115 | |
| Total Hardness by 2340B, Dissolved | mg/L | 6.6 | 7.0 | 106 | 85-115 | |
| Vanadium, Dissolved | mg/L | .08 | 0.081 | 101 | 85-115 | |
| Zinc, Dissolved | mg/L | .08 | 0.084 | 105 | 85-115 | |

MATRIX SPIKE SAMPLE: 1265872

| Parameter | Units | 10201585003 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | 0.0021 | .08 | 0.078 | 95 | 70-130 | |
| Calcium, Dissolved | mg/L | 122 | 1 | 126 | 410 | 70-130 | E,M1 |
| Chromium, Dissolved | mg/L | 0.0055 | .08 | 0.078 | 90 | 70-130 | |
| Magnesium, Dissolved | mg/L | 26.0 | 1 | 26.6 | 56 | 70-130 | M1 |
| Nickel, Dissolved | mg/L | 0.019 | .08 | 0.099 | 99 | 70-130 | |
| Selenium, Dissolved | mg/L | 1.9 | .08 | 1.9 | 54 | 70-130 | M1 |
| Total Hardness by 2340B, Dissolved | mg/L | 413 | 6.6 | 425 | 189 | 70-130 | |
| Vanadium, Dissolved | mg/L | 0.035 | .08 | 0.11 | 93 | 70-130 | |
| Zinc, Dissolved | mg/L | 0.082 | .08 | 0.16 | 96 | 70-130 | |

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## QUALITY CONTROL DATA

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1267499 1267500

| Parameter | Units | 10201585001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | 0.00056 | .08 | .08 | 0.084 | 0.082 | 105 | 102 | 70-130 | 2 | 20 | |
| Calcium, Dissolved | mg/L | 114 | 1 | 1 | 123 | 117 | 825 | 310 | 70-130 | 4 | 20 | E,M1 |
| Chromium, Dissolved | mg/L | 0.0050 | .08 | .08 | 0.086 | 0.084 | 101 | 99 | 70-130 | 2 | 20 | |
| Magnesium, Dissolved | mg/L | 25.6 | 1 | 1 | 26.7 | 26.0 | 114 | 48 | 70-130 | 3 | 20 | M1 |
| Nickel, Dissolved | mg/L | 0.0079 | .08 | .08 | 0.098 | 0.094 | 112 | 108 | 70-130 | 4 | 20 | |
| Selenium, Dissolved | mg/L | 1.8 | .08 | .08 | 1.9 | 1.9 | 166 | 112 | 70-130 | 2 | 20 | M1 |
| Total Hardness by 2340B, Dissolved | mg/L | 391 | 6.6 | 6.6 | 416 | 400 | 383 | 147 | 70-130 | 4 | 20 | |
| Vanadium, Dissolved | mg/L | 0.022 | .08 | .08 | 0.10 | 0.10 | 103 | 98 | 70-130 | 4 | 20 | |
| Zinc, Dissolved | mg/L | 0.020 | .08 | .08 | 0.12 | 0.11 | 120 | 115 | 70-130 | 4 | 20 | |

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# QUALIFIERS

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

## DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## LABORATORIES

| | |
|---|---|
| PASI-M | Pace Analytical Services - Minneapolis |

## ANALYTE QUALIFIERS

| | |
|---|---|
| B | Analyte was detected in the associated method blank. |
| E | Analyte concentration exceeded the calibration range. The reported result is estimated. |
| M1 | Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery. |

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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Revised: North Maybe Mine
Pace Project No.: 10201585

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **10201585001** | **IA1-30A-080612** | EPA 200.8 | MPRP/34582 | EPA 200.8 | ICPM/13386 |
| **10201585002** | **IA1-28A-080612** | EPA 200.8 | MPRP/34582 | EPA 200.8 | ICPM/13386 |
| **10201585003** | **IA1-55-080612** | EPA 200.8 | MPRP/34582 | EPA 200.8 | ICPM/13386 |
| **10201585004** | **DUP-080612-A** | EPA 200.8 | MPRP/34582 | EPA 200.8 | ICPM/13386 |
| **10201585001** | **IA1-30A-080612** | EPA 200.8 | MPRP/34510 | EPA 200.8 | ICPM/13383 |
| **10201585002** | **IA1-28A-080612** | EPA 200.8 | MPRP/34510 | EPA 200.8 | ICPM/13383 |
| **10201585003** | **IA1-55-080612** | EPA 200.8 | MPRP/34510 | EPA 200.8 | ICPM/13383 |
| **10201585004** | **DUP-080612-A** | EPA 200.8 | MPRP/34510 | EPA 200.8 | ICPM/13383 |

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

1134

10201585

Page: 1 of 1

| Section A Required Client Information: | | Section B Required Project Information: | | Section C Invoice Information: | |
|---|---|---|---|---|---|
| Company: | Agrium/Nu-West | Report To: | James.Williams@agrium.com | Attention: | Accounts Payable |
| Address: | 3010 Conda Rd | Copy To: | Julie.Lincoln@aecom.com | Company Name: | Nu-West Industries, Inc. |
| | Soda Springs, ID. 83276 | | | Address: | Calgary, Alberta, Canada T2H 3B9 |
| Email To: | Mitchell.Hart@agrium.com | Purchase Order No.: | 4800058265 | Pace Quote Reference: | Nor_040612_NMM SW |
| Phone: | 208-547-3935 Fax: | Project Name: | North Maybe Mine | Pace Project Manager: | Sally Heinje |
| Requested Due Date/TAT: | 7-10 Business Days | Project Number: | | Pace Profile #: | |

**REGULATORY AGENCY**

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: ID

Section D Required Client Information

**SAMPLE ID**
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

| MATRIX | CODE |
|---|---|
| DRINKING WATER | DW |
| WATER | WT |
| WASTE WATER | WW |
| PRODUCT | P |
| SOIL/SOLID | SL |
| OIL | OL |
| WIPE | WP |
| AIR | AR |
| OTHER | OT |
| TISSUE | TS |

| ITEM # | SAMPLE ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED: COMPOSITE START DATE | COLLECTED: COMPOSITE START TIME | COLLECTED: COMPOSITE END/GRAB DATE | COLLECTED: COMPOSITE END/GRAB TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Analysis Test Y/N | Requested Analysis Filtered (Y/N): Table 4-1 (enclosed) | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | IA1-30A-080612 | WT | G | 08/06/12 | | 1135 | | | 2 | | | ✓ | | | | | | X | | | 10201585001 |
| 2 | IA1-28A-080612 | WT | G | 08/06/12 | | 1150 | | | 2 | | | ✓ | | | | | | X | | | 002 |
| 3 | IA1-55-080612 | WT | G | 08/06/12 | | 1205 | | | 2 | | | ✓ | | | | | | X | | | 003 |
| 4 | DUP-080612-A | WT | G | 08/06/12 | | 1100 | | | 2 | | | ✓ | | | | | | X | | | 004 |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| cooler id # 104276 | James B. Williams | 08/07/12 | 0800 | CJ PACE | 8.8.12 | 955 | 1.6 | 4 | 4 | 4 |
| Level III data package | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| SAMPLER NAME AND SIGNATURE | | | Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N) |
|---|---|---|---|---|---|---|
| PRINT Name of SAMPLER: | James B. Williams | | | | | |
| SIGNATURE of SAMPLER: | James B. Williams | DATE Signed (MM/DD/YY): 08/06/12 | | | | |

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.08, 12-Oct-2007

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## Table 4-1 Surface water Analyte List for April, May, June, August, September and October

| Analyte | Analytical Method | Container Size | | Container Material | Preservative | Holding Time | Detection Limit/Units |
|---|---|---|---|---|---|---|---|
| | | Total | Dissolved | | | | |
| Cadmium – total & dissolved* | EPA M200.8 | 250 ml | 250 ml* | Polyethylene | Nitric Acid | 180 Days | 0.1 µg/L |
| Chromium – total & dissolved* | EPA M200.8 | | | | | | 0.1 µg/L |
| Nickel – total & dissolved* | EPA M200.8 | | | | | | 0.6 µg/L |
| Selenium – total & dissolved* | EPA M200.8 | | | | | | 0.1 µg/L |
| Vanadium – total & dissolved* | EPA M200.8 | | | | | | 0.2 µg/L |
| Zinc – total & dissolved* | EPA M200.8 | | | | | | 2 µg/L |
| Hardness | EPA SM2340B (Calculated) | - | | Polyethylene | Nitric Acid | 180 Days | 2 mg/L |
| pH | Field | - | - | - | - | Analyze immediately | standard units |
| ORP | Field | - | - | - | - | | mV |
| Dissolved Oxygen | Field | - | - | - | - | | mg/L |
| Conductivity | Field | - | - | - | - | | µmhos/cm |
| Temperature | Field | - | - | - | - | | °C |
| Turbidity | Field | - | - | - | - | | NTU |

* Sample for dissolved analysis will be field filtered using a disposable 0.45 micron filter prior to preservation
ml = milliliters
µg/L = micrograms per liter
mg/L = milligrams per liter
mV = millivolts
µmhos/cm = micromhos per centimeter
°C = degrees Celsius
NTU = nephelometric turbidity units

| Pace Analytical® | Document Name: Sample Condition Upon Receipt Form | Document Revised: 19Jun2012 Page 1 of 1 |
|---|---|---|
| | Document No.: F-MN-L-213-rev.03 | Issuing Authority: Pace Minnesota Quality Office |

**Sample Condition Upon Receipt**

**Client Name:** Agrium

**Project #:** WO# : 10201585

10201585

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other:

Tracking Number: 4569 1405 9555

Custody Seal on Cooler/Box Present? ☒ Yes ☐ No Seals Intact? ☒ Yes ☐ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other: Temp Blank? ☒ Yes ☐ No

Thermometer Used: ☐ 80344042 ☒ 80512447 Type of Ice: ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temperature: 1.6 Biological Tissue Frozen? ☐ Yes ☐ No Date and Initials of Person Examining Contents: CS 8/8/12

Temp should be above freezing to 6°C

| | | | | Comments: |
|---|---|---|---|---|
| Chain of Custody Present? | ☒ Yes | ☐ No | ☐ N/A | 1. |
| Chain of Custody Filled Out? | ☒ Yes | ☐ No | ☐ N/A | 2. |
| Chain of Custody Relinquished? | ☒ Yes | ☐ No | ☐ N/A | 3. |
| Sampler Name and Signature on COC? | ☒ Yes | ☐ No | ☐ N/A | 4. |
| Samples Arrived within Hold Time? | ☒ Yes | ☐ No | ☐ N/A | 5. |
| Short Hold Time Analysis (<72 hr)? | ☐ Yes | ☒ No | ☐ N/A | 6. |
| Rush Turn Around Time Requested? | ☐ Yes | ☒ No | ☐ N/A | 7. |
| Sufficient Volume? | ☒ Yes | ☐ No | ☐ N/A | 8. |
| Correct Containers Used? | ☒ Yes | ☐ No | ☐ N/A | 9. |
| -Pace Containers Used? | ☒ Yes | ☐ No | ☐ N/A | |
| Containers Intact? | ☒ Yes | ☐ No | ☐ N/A | 10. |
| Filtered Volume Received for Dissolved Tests? | ☐ Yes | ☐ No | ☒ N/A | 11. |
| Sample Labels Match COC? | ☒ Yes | ☐ No | ☐ N/A | 12. |
| -Includes Date/Time/ID/Analysis Matrix: WI | | | | |
| All containers needing acid/base preservation have been checked? Noncompliances are noted in 13. | ☒ Yes | ☐ No | ☐ N/A | 13. ☒ $HNO_3$ 2 2 ☐ $H_2SO_4$ ☐ NaOH ☐ HCl |
| All containers needing preservation are found to be in compliance with EPA recommendation? ($HNO_3$, $H_2SO_4$, HCl<2; NaOH>12) | ☒ Yes | ☐ No | ☐ N/A | Sample # I41-30128, 55 Dup |
| Exceptions: VOA, Coliform, TOC, Oil and Grease, WI-DRO (water) | ☐ Yes | ☒ No | | Initial when completed: CS Lot # of added preservative: |
| Headspace in VOA Vials ( >6mm)? | ☐ Yes | ☐ No | ☒ N/A | 14. |
| Trip Blank Present? | ☐ Yes | ☐ No | ☒ N/A | 15. |
| Trip Blank Custody Seals Present? | ☐ Yes | ☐ No | ☒ N/A | |
| Pace Trip Blank Lot # (if purchased): | | | | |

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required? ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

**Project Manager Review:** Date:

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

# DATA VALIDATION REPORT

| | |
|---|---|
| Company: | AECOM Environment |
| Project Name: | Agrium, Inc. |
| Laboratory: | Pace Analytical Services, Inc. |
| Pace Project ID: | 10204498 |
| Data Validator: | Chris Davis |
| Date Validated: | December 6, 2012 |
| Reviewer: | Julie Lincoln |
| Date Reviewed: | December 7, 2012 |
| Sample Media: | Surface Water |
| Analytical Parameters and Methods: | 1. Total and Dissolved Metals (cadmium, chromium, nickel, selenium, vanadium, and zinc); 200.8<br>2. Dissolved Cations (calcium, magnesium); 200.8<br>3. Hardness; SM2340B |
| Sample Identifications: | IA1-30A-090412<br>IA1-28A-090412<br>IA1-55-090412<br>DUP-090412-A (field duplicate for IA1-28A-090412) |

## 1. PRESERVATION AND HOLDING TIMES

Preservation: Acceptable.

Holding Time: Acceptable.

## 2. BLANKS

Non-detected for all laboratory reagent blanks (LRBs).

**Qualification:** No qualification was necessary.

## 3. LABORATORY CONTROL SAMPLES

Acceptable.

## 4. DUPLICATE ANALYSES

Acceptable.

## 5. SPIKE SAMPLE ANALYSES

Acceptable with the following exceptions. The percent recoveries (%Rs) of 128% and 130% for dissolved zinc in the matrix spike (MS)/matrix spike duplicate (MSD) and 126% for dissolved vanadium in the MS analyses of sample IA1-30A-090412 (10204498-001) exceeded the 75-125%R control limits for metals.

**Qualification:** The associated results for dissolved vanadium and zinc were qualified as estimated (J+) for potential minor high bias. The associated results for total vanadium and zinc were also qualified as estimated (J+) for potential minor high bias as no project-specific MS/MSD was analyzed for total metals for this SDG.

Note that the percent recoveries (%Rs) of 1620% and 465% for dissolved calcium, 489% and 426% for dissolved magnesium in the MS/MSD, and 347% for dissolved selenium in the MS analyses of sample IA1-30A-090412 (10204498-001) exceeded the 75-125%R control limits for metals. For sample results that exceed four-times the concentration of the spike, spike recovery limits do not apply and the data are not considered to exceed acceptance criteria, even if the %Rs do not meet the specified control limits, as specified in the Functional Guidelines. As the sample results exceeded four times the spike, no qualifiers are applicable.

## 6. OVERALL ASSESSMENT

No other issues were identified.

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1700 Elm Street - Suite 200
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September 14, 2012

Mitchell Hart
Nu-West Industries, Inc
3010 Conda Road
Soda Springs, ID 83276

RE: Project: North Maybe Mine
Pace Project No.: 10204498

Dear Mitchell Hart:
Enclosed are the analytical results for sample(s) received by the laboratory on September 06, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Cindy Emmons, Norwest Corporation
James Williams, Agrium

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## CERTIFICATIONS

Project: North Maybe Mine
Pace Project No.: 10204498

**Minnesota Certification IDs**
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Hawaii Certification #Pace
Idaho Certification #: MN00064
Illinois Certification #: 200011
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia/DCLS Certification #: 002521
Virginia/VELAP Certification #: 460163
Washington Certification #: C754
West Virginia Certification #: 382
Wisconsin Certification #: 999407970

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## SAMPLE SUMMARY

Project: North Maybe Mine
Pace Project No.: 10204498

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| 10204498001 | IA1-30A-090412 | Water | 09/04/12 10:45 | 09/06/12 10:05 |
| 10204498002 | IA1-28A-090412 | Water | 09/04/12 11:00 | 09/06/12 10:05 |
| 10204498003 | IA1-55-090412 | Water | 09/04/12 11:25 | 09/06/12 10:05 |
| 10204498004 | DUP-090412-A | Water | 09/04/12 10:30 | 09/06/12 10:05 |

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## SAMPLE ANALYTE COUNT

Project: North Maybe Mine
Pace Project No.: 10204498

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| 10204498001 | IA1-30A-090412 | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |
| 10204498002 | IA1-28A-090412 | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |
| 10204498003 | IA1-55-090412 | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |
| 10204498004 | DUP-090412-A | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10204498

**Method:** EPA 200.8
**Description:** 200.8 MET ICPMS
**Client:** Agrium- Nu-West
**Date:** September 14, 2012

**General Information:**
4 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10204498

**Method:** EPA 200.8
**Description:** 200.8 MET ICPMS, Dissolved
**Client:** Agrium- Nu-West
**Date:** September 14, 2012

**General Information:**
4 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/35057

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10204498001,10204616007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1283451)
  - Magnesium, Dissolved
- MS (Lab ID: 1283453)
  - Calcium, Dissolved
  - Magnesium, Dissolved
- MSD (Lab ID: 1283452)
  - Magnesium, Dissolved

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1283451)
  - Calcium, Dissolved
  - Selenium, Dissolved
- MSD (Lab ID: 1283452)
  - Calcium, Dissolved

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10204498

**Method:** **EPA 200.8**
**Description:** 200.8 MET ICPMS, Dissolved
**Client:** Agrium- Nu-West
**Date:** September 14, 2012

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10204498

**Sample: IA1-30A-090412** **Lab ID: 10204498001** Collected: 09/04/12 10:45 Received: 09/06/12 10:05 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.00055** | mg/L | 0.000080 | 0.000028 | 1 | 09/08/12 08:58 | 09/12/12 03:25 | 7440-43-9 | |
| Chromium | **0.0039** | mg/L | 0.00050 | 0.000094 | 1 | 09/08/12 08:58 | 09/12/12 03:25 | 7440-47-3 | |
| Nickel | **0.0069** | mg/L | 0.00050 | 0.00015 | 1 | 09/08/12 08:58 | 09/12/12 03:25 | 7440-02-0 | |
| Selenium | **1.9** | mg/L | 0.0025 | 0.00047 | 5 | 09/08/12 08:58 | 09/12/12 03:38 | 7782-49-2 | |
| Vanadium | **0.020** | mg/L | 0.00010 | 0.000037 | 1 | 09/08/12 08:58 | 09/12/12 03:25 | 7440-62-2 | |
| Zinc | **0.018** | mg/L | 0.0050 | 0.0010 | 1 | 09/08/12 08:58 | 09/12/12 03:25 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.00055** | mg/L | 0.000080 | 0.000028 | 1 | 09/08/12 08:57 | 09/12/12 00:47 | 7440-43-9 | |
| Calcium, Dissolved | **126** | mg/L | 0.50 | 0.25 | 25 | 09/08/12 08:57 | 09/12/12 18:23 | 7440-70-2 | M6 |
| Chromium, Dissolved | **0.0044** | mg/L | 0.00050 | 0.000094 | 1 | 09/08/12 08:57 | 09/12/12 00:47 | 7440-47-3 | |
| Magnesium, Dissolved | **27.1** | mg/L | 0.025 | 0.012 | 5 | 09/08/12 08:57 | 09/12/12 18:07 | 7439-95-4 | M1 |
| Nickel, Dissolved | **0.0071** | mg/L | 0.00050 | 0.00015 | 1 | 09/08/12 08:57 | 09/12/12 00:47 | 7440-02-0 | |
| Selenium, Dissolved | **1.9** | mg/L | 0.0025 | 0.00047 | 5 | 09/08/12 08:57 | 09/12/12 18:07 | 7782-49-2 | M6 |
| Total Hardness by 2340B, Dissolved | **427** | mg/L | 1.8 | 0.89 | 25 | 09/08/12 08:57 | 09/12/12 18:23 | | |
| Vanadium, Dissolved | **0.022** | mg/L | 0.00010 | 0.000037 | 1 | 09/08/12 08:57 | 09/12/12 00:47 | 7440-62-2 | |
| Zinc, Dissolved | **0.017** | mg/L | 0.0050 | 0.0010 | 1 | 09/08/12 08:57 | 09/12/12 00:47 | 7440-66-6 | |

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10204498

**Sample: IA1-28A-090412** **Lab ID: 10204498002** Collected: 09/04/12 11:00 Received: 09/06/12 10:05 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0015** | mg/L | 0.000080 | 0.000028 | 1 | 09/08/12 08:58 | 09/12/12 03:42 | 7440-43-9 | |
| Chromium | **0.0049** | mg/L | 0.00050 | 0.000094 | 1 | 09/08/12 08:58 | 09/12/12 03:42 | 7440-47-3 | |
| Nickel | **0.016** | mg/L | 0.00050 | 0.00015 | 1 | 09/08/12 08:58 | 09/12/12 03:42 | 7440-02-0 | |
| Selenium | **2.0** | mg/L | 0.0025 | 0.00047 | 5 | 09/08/12 08:58 | 09/12/12 03:46 | 7782-49-2 | |
| Vanadium | **0.035** | mg/L | 0.00010 | 0.000037 | 1 | 09/08/12 08:58 | 09/12/12 03:42 | 7440-62-2 | |
| Zinc | **0.048** | mg/L | 0.0050 | 0.0010 | 1 | 09/08/12 08:58 | 09/12/12 03:42 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.00086** | mg/L | 0.000080 | 0.000028 | 1 | 09/08/12 08:57 | 09/12/12 01:04 | 7440-43-9 | |
| Calcium, Dissolved | **140** | mg/L | 0.20 | 0.10 | 10 | 09/08/12 08:57 | 09/12/12 18:27 | 7440-70-2 | |
| Chromium, Dissolved | **0.0049** | mg/L | 0.00050 | 0.000094 | 1 | 09/08/12 08:57 | 09/12/12 01:04 | 7440-47-3 | |
| Magnesium, Dissolved | **27.2** | mg/L | 0.025 | 0.012 | 5 | 09/08/12 08:57 | 09/12/12 01:08 | 7439-95-4 | |
| Nickel, Dissolved | **0.015** | mg/L | 0.00050 | 0.00015 | 1 | 09/08/12 08:57 | 09/12/12 01:04 | 7440-02-0 | |
| Selenium, Dissolved | **2.1** | mg/L | 0.0025 | 0.00047 | 5 | 09/08/12 08:57 | 09/12/12 01:08 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **462** | mg/L | 0.71 | 0.36 | 10 | 09/08/12 08:57 | 09/12/12 18:27 | | |
| Vanadium, Dissolved | **0.036** | mg/L | 0.00010 | 0.000037 | 1 | 09/08/12 08:57 | 09/12/12 01:04 | 7440-62-2 | |
| Zinc, Dissolved | **0.034** | mg/L | 0.0050 | 0.0010 | 1 | 09/08/12 08:57 | 09/12/12 01:04 | 7440-66-6 | |

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10204498

**Sample: IA1-55-090412** **Lab ID: 10204498003** Collected: 09/04/12 11:25 Received: 09/06/12 10:05 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0020** | mg/L | 0.000080 | 0.000028 | 1 | 09/08/12 08:58 | 09/12/12 03:49 | 7440-43-9 | |
| Chromium | **0.0049** | mg/L | 0.00050 | 0.000094 | 1 | 09/08/12 08:58 | 09/12/12 03:49 | 7440-47-3 | |
| Nickel | **0.017** | mg/L | 0.00050 | 0.00015 | 1 | 09/08/12 08:58 | 09/12/12 03:49 | 7440-02-0 | |
| Selenium | **2.0** | mg/L | 0.0025 | 0.00047 | 5 | 09/08/12 08:58 | 09/12/12 03:53 | 7782-49-2 | |
| Vanadium | **0.034** | mg/L | 0.00010 | 0.000037 | 1 | 09/08/12 08:58 | 09/12/12 03:49 | 7440-62-2 | |
| Zinc | **0.077** | mg/L | 0.0050 | 0.0010 | 1 | 09/08/12 08:58 | 09/12/12 03:49 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0021** | mg/L | 0.000080 | 0.000028 | 1 | 09/08/12 08:57 | 09/12/12 01:12 | 7440-43-9 | |
| Calcium, Dissolved | **123** | mg/L | 0.20 | 0.10 | 10 | 09/08/12 08:57 | 09/12/12 18:32 | 7440-70-2 | |
| Chromium, Dissolved | **0.0050** | mg/L | 0.00050 | 0.000094 | 1 | 09/08/12 08:57 | 09/12/12 01:12 | 7440-47-3 | |
| Magnesium, Dissolved | **25.8** | mg/L | 0.025 | 0.012 | 5 | 09/08/12 08:57 | 09/12/12 01:16 | 7439-95-4 | |
| Nickel, Dissolved | **0.018** | mg/L | 0.00050 | 0.00015 | 1 | 09/08/12 08:57 | 09/12/12 01:12 | 7440-02-0 | |
| Selenium, Dissolved | **2.0** | mg/L | 0.0025 | 0.00047 | 5 | 09/08/12 08:57 | 09/12/12 01:16 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **415** | mg/L | 0.71 | 0.36 | 10 | 09/08/12 08:57 | 09/12/12 18:32 | | |
| Vanadium, Dissolved | **0.034** | mg/L | 0.00010 | 0.000037 | 1 | 09/08/12 08:57 | 09/12/12 01:12 | 7440-62-2 | |
| Zinc, Dissolved | **0.077** | mg/L | 0.0050 | 0.0010 | 1 | 09/08/12 08:57 | 09/12/12 01:12 | 7440-66-6 | |

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10204498

**Sample: DUP-090412-A** **Lab ID: 10204498004** Collected: 09/04/12 10:30 Received: 09/06/12 10:05 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0014** | mg/L | 0.000080 | 0.000028 | 1 | 09/08/12 08:58 | 09/12/12 04:15 | 7440-43-9 | |
| Chromium | **0.0051** | mg/L | 0.00050 | 0.000094 | 1 | 09/08/12 08:58 | 09/12/12 04:15 | 7440-47-3 | |
| Nickel | **0.015** | mg/L | 0.00050 | 0.00015 | 1 | 09/08/12 08:58 | 09/12/12 04:15 | 7440-02-0 | |
| Selenium | **1.9** | mg/L | 0.0025 | 0.00047 | 5 | 09/08/12 08:58 | 09/12/12 04:19 | 7782-49-2 | |
| Vanadium | **0.034** | mg/L | 0.00010 | 0.000037 | 1 | 09/08/12 08:58 | 09/12/12 04:15 | 7440-62-2 | |
| Zinc | **0.046** | mg/L | 0.0050 | 0.0010 | 1 | 09/08/12 08:58 | 09/12/12 04:15 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.00083** | mg/L | 0.000080 | 0.000028 | 1 | 09/08/12 08:57 | 09/12/12 01:37 | 7440-43-9 | |
| Calcium, Dissolved | **118** | mg/L | 0.20 | 0.10 | 10 | 09/08/12 08:57 | 09/12/12 18:36 | 7440-70-2 | |
| Chromium, Dissolved | **0.0047** | mg/L | 0.00050 | 0.000094 | 1 | 09/08/12 08:57 | 09/12/12 01:37 | 7440-47-3 | |
| Magnesium, Dissolved | **25.4** | mg/L | 0.025 | 0.012 | 5 | 09/08/12 08:57 | 09/12/12 01:41 | 7439-95-4 | |
| Nickel, Dissolved | **0.014** | mg/L | 0.00050 | 0.00015 | 1 | 09/08/12 08:57 | 09/12/12 01:37 | 7440-02-0 | |
| Selenium, Dissolved | **2.0** | mg/L | 0.0025 | 0.00047 | 5 | 09/08/12 08:57 | 09/12/12 01:41 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **398** | mg/L | 0.71 | 0.36 | 10 | 09/08/12 08:57 | 09/12/12 18:36 | | |
| Vanadium, Dissolved | **0.034** | mg/L | 0.00010 | 0.000037 | 1 | 09/08/12 08:57 | 09/12/12 01:37 | 7440-62-2 | |
| Zinc, Dissolved | **0.032** | mg/L | 0.0050 | 0.0010 | 1 | 09/08/12 08:57 | 09/12/12 01:37 | 7440-66-6 | |

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## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10204498

QC Batch: MPRP/35059 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10204498001, 10204498002, 10204498003, 10204498004

METHOD BLANK: 1283458 Matrix: Water
Associated Lab Samples: 10204498001, 10204498002, 10204498003, 10204498004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Cadmium | mg/L | <0.000028 | 0.000080 | 09/12/12 03:21 | |
| Chromium | mg/L | <0.000094 | 0.00050 | 09/12/12 03:21 | |
| Nickel | mg/L | <0.00015 | 0.00050 | 09/12/12 03:21 | |
| Selenium | mg/L | <0.000094 | 0.00050 | 09/12/12 03:21 | |
| Vanadium | mg/L | <0.000037 | 0.00010 | 09/12/12 03:21 | |
| Zinc | mg/L | <0.0010 | 0.0050 | 09/12/12 03:21 | |

LABORATORY CONTROL SAMPLE: 1283459

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Cadmium | mg/L | .08 | 0.081 | 101 | 85-115 | |
| Chromium | mg/L | .08 | 0.079 | 98 | 85-115 | |
| Nickel | mg/L | .08 | 0.079 | 98 | 85-115 | |
| Selenium | mg/L | .08 | 0.082 | 102 | 85-115 | |
| Vanadium | mg/L | .08 | 0.078 | 98 | 85-115 | |
| Zinc | mg/L | .08 | 0.082 | 103 | 85-115 | |

MATRIX SPIKE SAMPLE: 1283462

| Parameter | Units | 10204616007 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Cadmium | mg/L | <0.000028 | .08 | 0.078 | 98 | 70-130 | |
| Chromium | mg/L | 0.00028J | .08 | 0.077 | 96 | 70-130 | |
| Nickel | mg/L | <0.00015 | .08 | 0.078 | 98 | 70-130 | |
| Selenium | mg/L | <0.000094 | .08 | 0.076 | 95 | 70-130 | |
| Vanadium | mg/L | 0.00026 | .08 | 0.076 | 95 | 70-130 | |
| Zinc | mg/L | <0.0010 | .08 | 0.084 | 105 | 70-130 | |

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## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10204498

QC Batch: MPRP/35057 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10204498001, 10204498002, 10204498003, 10204498004

METHOD BLANK: 1283449 Matrix: Water
Associated Lab Samples: 10204498001, 10204498002, 10204498003, 10204498004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | <0.000028 | 0.000080 | 09/12/12 00:43 | |
| Calcium, Dissolved | mg/L | <0.010 | 0.020 | 09/12/12 00:43 | |
| Chromium, Dissolved | mg/L | <0.000094 | 0.00050 | 09/12/12 00:43 | |
| Magnesium, Dissolved | mg/L | <0.0023 | 0.0050 | 09/12/12 00:43 | |
| Nickel, Dissolved | mg/L | <0.00015 | 0.00050 | 09/12/12 00:43 | |
| Selenium, Dissolved | mg/L | <0.000094 | 0.00050 | 09/12/12 00:43 | |
| Total Hardness by 2340B, Dissolved | mg/L | <0.036 | 0.071 | 09/12/12 00:43 | |
| Vanadium, Dissolved | mg/L | <0.000037 | 0.00010 | 09/12/12 00:43 | |
| Zinc, Dissolved | mg/L | <0.0010 | 0.0050 | 09/12/12 00:43 | |

LABORATORY CONTROL SAMPLE: 1283450

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | .08 | 0.080 | 100 | 85-115 | |
| Calcium, Dissolved | mg/L | 1 | 0.98 | 98 | 85-115 | |
| Chromium, Dissolved | mg/L | .08 | 0.079 | 98 | 85-115 | |
| Magnesium, Dissolved | mg/L | 1 | 1.0 | 100 | 85-115 | |
| Nickel, Dissolved | mg/L | .08 | 0.079 | 99 | 85-115 | |
| Selenium, Dissolved | mg/L | .08 | 0.080 | 100 | 85-115 | |
| Total Hardness by 2340B, Dissolved | mg/L | 6.6 | 6.6 | 99 | 85-115 | |
| Vanadium, Dissolved | mg/L | .08 | 0.078 | 98 | 85-115 | |
| Zinc, Dissolved | mg/L | .08 | 0.082 | 103 | 85-115 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1283451 1283452

| Parameter | Units | 10204498001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | 0.00055 | .08 | .08 | 0.098 | 0.098 | 121 | 122 | 70-130 | .5 | 20 | |
| Calcium, Dissolved | mg/L | 126 | 1 | 1 | 142 | 131 | 1620 | 465 | 70-130 | 8 | 20 | M6 |
| Chromium, Dissolved | mg/L | 0.0044 | .08 | .08 | 0.10 | 0.10 | 122 | 123 | 70-130 | .6 | 20 | |
| Magnesium, Dissolved | mg/L | 27.1 | 1 | 1 | 32.0 | 31.4 | 489 | 423 | 70-130 | 2 | 20 | M1 |
| Nickel, Dissolved | mg/L | 0.0071 | .08 | .08 | 0.11 | 0.10 | 125 | 122 | 70-130 | 2 | 20 | |
| Selenium, Dissolved | mg/L | 1.9 | .08 | .08 | 2.2 | 2.0 | 347 | 121 | 70-130 | 9 | 20 | M6 |
| Total Hardness by 2340B, Dissolved | mg/L | 427 | 6.6 | 6.6 | 487 | 456 | 914 | 439 | 70-130 | 7 | 20 | |
| Vanadium, Dissolved | mg/L | 0.022 | .08 | .08 | 0.12 | 0.12 | 126 | 125 | 70-130 | .2 | 20 | |
| Zinc, Dissolved | mg/L | 0.017 | .08 | .08 | 0.12 | 0.12 | 128 | 130 | 70-130 | 1 | 20 | |

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## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10204498

MATRIX SPIKE SAMPLE: 1283453

| Parameter | Units | 10204616007 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | <0.000028 | .08 | 0.079 | 98 | 70-130 | |
| Calcium, Dissolved | mg/L | 54.7 | 1 | 56.4 | 175 | 70-130 | M1 |
| Chromium, Dissolved | mg/L | 0.00029J | .08 | 0.078 | 97 | 70-130 | |
| Magnesium, Dissolved | mg/L | 11.1 | 1 | 12.5 | 140 | 70-130 | M1 |
| Nickel, Dissolved | mg/L | <0.00015 | .08 | 0.077 | 97 | 70-130 | |
| Selenium, Dissolved | mg/L | <0.000094 | .08 | 0.081 | 101 | 70-130 | |
| Total Hardness by 2340B, Dissolved | mg/L | 182 | 6.6 | 193 | 154 | 70-130 | |
| Vanadium, Dissolved | mg/L | 0.00029 | .08 | 0.078 | 97 | 70-130 | |
| Zinc, Dissolved | mg/L | 0.0017J | .08 | 0.081 | 100 | 70-130 | |

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## QUALIFIERS

Project: North Maybe Mine
Pace Project No.: 10204498

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: North Maybe Mine
Pace Project No.: 10204498

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **10204498001** | **IA1-30A-090412** | EPA 200.8 | MPRP/35059 | EPA 200.8 | ICPM/13678 |
| **10204498002** | **IA1-28A-090412** | EPA 200.8 | MPRP/35059 | EPA 200.8 | ICPM/13678 |
| **10204498003** | **IA1-55-090412** | EPA 200.8 | MPRP/35059 | EPA 200.8 | ICPM/13678 |
| **10204498004** | **DUP-090412-A** | EPA 200.8 | MPRP/35059 | EPA 200.8 | ICPM/13678 |
| **10204498001** | **IA1-30A-090412** | EPA 200.8 | MPRP/35057 | EPA 200.8 | ICPM/13679 |
| **10204498002** | **IA1-28A-090412** | EPA 200.8 | MPRP/35057 | EPA 200.8 | ICPM/13679 |
| **10204498003** | **IA1-55-090412** | EPA 200.8 | MPRP/35057 | EPA 200.8 | ICPM/13679 |
| **10204498004** | **DUP-090412-A** | EPA 200.8 | MPRP/35057 | EPA 200.8 | ICPM/13679 |

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10204498

Page: 1 of 1

| Section A Required Client Information: | | Section B Required Project Information: | | Section C Invoice Information: | |
|---|---|---|---|---|---|
| Company: | Agrium/Nu-West | Report To: | James.Williams@agrium.com | Attention: | Accounts Payable |
| Address: | 3010 Conda Rd | Copy To: | Julie.Lincoln@aecom.com | Company Name: | Nu-West Industries, Inc. |
| | Soda Springs, ID. 83276 | | | Address: | Calgary, Alberta, Canada T2H 3B9 |
| Email To: | Mitchell.Hart@agrium.com | Purchase Order No.: | 4800058265 | Pace Quote Reference: | Nor_040612_NMM SW |
| Phone: | 208-547-3935 Fax | Project Name: | North Maybe Mine | Pace Project Manager: | Sally Heinje |
| Requested Due Date/TAT: | 7-10 Business Days | Project Number: | | Pace Profile #: | |

**REGULATORY AGENCY**

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: ID

Section D Required Client Information

**SAMPLE ID**
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

| MATRIX | CODE |
|---|---|
| DRINKING WATER | DW |
| WATER | WT |
| WASTE WATER | WW |
| PRODUCT | P |
| SOIL/SOLID | SL |
| OIL | OL |
| WIPE | WP |
| AIR | AR |
| OTHER | OT |
| TISSUE | TS |

| ITEM # | SAMPLE ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED COMPOSITE START DATE | COLLECTED COMPOSITE START TIME | COLLECTED COMPOSITE END/GRAB TIME DATE | COLLECTED COMPOSITE END/GRAB TIME TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Requested Analysis Filtered (Y/N) Y/N | Analysis Test: Table 4-1 (enclosed) | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | IAI-30A-090412 | WT | G | 09/04/12 | | 1045 | | | 2 | | | ✓ | | | | | | X | | 10204498001 |
| 2 | IAI-28A-090412 | WT | G | 09/04/12 | | 1100 | | | 2 | | | ✓ | | | | | | X | | 002 |
| 3 | IAI-55-090412 | WT | G | 09/04/12 | | 1125 | | | 2 | | | ✓ | | | | | | X | | 003 |
| 4 | DUP-090412-A | WT | G | 09/04/12 | | 1030 | | | 2 | | | ✓ | | | | | | X | | 004 |
| 5 | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| cooler id # 10600720 | James B. Williams | 09/05/12 | 08:00 | CSI PACE | 9-6-12 | 1005 | 33 | Y | Y | Y |
| Level III data package | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

17 of 19

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: James B. Williams

SIGNATURE of SAMPLER: James B. Williams DATE Signed (MM/DD/YY): 09/04/12

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

## Table 4-1 Surface water Analyte List for April, May, June, August, September and October

| Analyte | Analytical Method | Container Size | | Container Material | Preservative | Holding Time | Detection Limit/Units |
|---|---|---|---|---|---|---|---|
| | | Total | Dissolved | | | | |
| Cadmium – total & dissolved* | EPA M200.8 | 250 ml | 250 ml* | Polyethylene | Nitric Acid | 180 Days | 0.1 µg/L |
| Chromium – total & dissolved* | EPA M200.8 | | | | | | 0.1 µg/L |
| Nickel – total & dissolved* | EPA M200.8 | | | | | | 0.6 µg/L |
| Selenium – total & dissolved* | EPA M200.8 | | | | | | 0.1 µg/L |
| Vanadium – total & dissolved* | EPA M200.8 | | | | | | 0.2 µg/L |
| Zinc – total & dissolved* | EPA M200.8 | | | | | | 2 µg/L |
| Hardness | EPA SM2340B (Calculated) | - | | Polyethylene | Nitric Acid | 180 Days | 2 mg/L |
| pH | Field | - | - | - | - | Analyze immediately | standard units |
| ORP | Field | - | - | - | - | | mV |
| Dissolved Oxygen | Field | - | - | - | - | | mg/L |
| Conductivity | Field | - | - | - | - | | µmhos/cm |
| Temperature | Field | - | - | - | - | | °C |
| Turbidity | Field | - | - | - | - | | NTU |

* Sample for dissolved analysis will be field filtered using a disposable 0.45 micron filter prior to preservation
ml = milliliters
µg/L = micrograms per liter
mg/L = milligrams per liter
mV = millivolts
µmhos/cm = micromhos per centimeter
°C = degrees Celsius
NTU = nephelometric turbidity units

| Pace Analytical | Document Name: Sample Condition Upon Receipt Form | Document Revised: 22Aug2012 Page 1 of 1 |
|---|---|---|
| | Document No.: F-MN-L-213-rev.04 | Issuing Authority: Pace Minnesota Quality Office |

**Sample Condition Upon Receipt**

**Client Name:** agrium

**Project #:** WO# : 10204498

10204498

**Courier:** ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other:

**Tracking Number:** 4569 1406 4392

**Custody Seal on Cooler/Box Present?** ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No

**Optional:** Proj. Due Date: Proj. Name:

**Packing Material:** ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☑ Yes ☐ No

**Thermometer Used:** ☑ 888A912167504 ☐ B0512447 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

**Cooler Temperature:** 33 **Biological Tissue Frozen?** ☐ Yes ☐ No **Date and Initials of Person Examining Contents:** CSL 9.6.12

Temp should be above freezing to 6°C

| | | | | Comments: |
|---|---|---|---|---|
| Chain of Custody Present? | ☑ Yes | ☐ No | ☐ N/A | 1. |
| Chain of Custody Filled Out? | ☑ Yes | ☐ No | ☐ N/A | 2. |
| Chain of Custody Relinquished? | ☑ Yes | ☐ No | ☐ N/A | 3. |
| Sampler Name and/or Signature on COC? | ☑ Yes | ☐ No | ☐ N/A | 4. |
| Samples Arrived within Hold Time? | ☑ Yes | ☐ No | ☐ N/A | 5. |
| Short Hold Time Analysis (<72 hr)? | ☐ Yes | ☑ No | ☐ N/A | 6. |
| Rush Turn Around Time Requested? | ☐ Yes | ☑ No | ☐ N/A | 7. |
| Sufficient Volume? | ☑ Yes | ☐ No | ☐ N/A | 8. |
| Correct Containers Used? | ☑ Yes | ☐ No | ☐ N/A | 9. |
| -Pace Containers Used? | ☑ Yes | ☐ No | ☐ N/A | |
| Containers Intact? | ☑ Yes | ☐ No | ☐ N/A | 10. |
| Filtered Volume Received for Dissolved Tests? | ☐ Yes | ☐ No | ☑ N/A | 11. |
| Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT | ☑ Yes | ☐ No | ☐ N/A | 12. |
| All containers needing acid/base preservation have been checked? Noncompliances are noted in 13. | ☑ Yes | ☐ No | ☐ N/A | 13. ☑ $HNO_3$ ☐ $H_2SO_4$ ☐ NaOH ☐ HCl 2-2 |
| All containers needing preservation are found to be in compliance with EPA recommendation? ($HNO_3$, $H_2SO_4$, HCl<2; NaOH>12) | ☑ Yes | ☐ No | ☐ N/A | Sample # 30A, 28A, 55, DUP |
| Exceptions: VOA, Coliform, TOC, Oil and Grease, WI-DRO (water) | ☐ Yes | ☑ No | | Initial when completed: CSL Lot # of added preservative: |
| Headspace in VOA Vials ( >6mm)? | ☐ Yes | ☐ No | ☑ N/A | 14. |
| Trip Blank Present? | ☐ Yes | ☐ No | ☑ N/A | 15. |
| Trip Blank Custody Seals Present? | ☐ Yes | ☐ No | ☑ N/A | |
| Pace Trip Blank Lot # (if purchased): | | | | |

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

**Project Manager Review:** **Date:**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out hold, incorrect preservative, out of temp, incorrect containers)

# DATA VALIDATION REPORT

| | |
|---|---|
| Company: | AECOM Environment |
| Project Name: | Agrium, Inc. |
| Laboratory: | Pace Analytical Services, Inc. |
| Pace Project ID: | 10207426 |
| Data Validator: | Chris Davis |
| Date Validated: | December 6, 2012 |
| Reviewer: | Julie Lincoln |
| Date Reviewed: | December 7, 2012 |
| Sample Media: | Surface Water |

Analytical Parameters and Methods:

1. Total and Dissolved Metals (cadmium, chromium, nickel, selenium, vanadium, and zinc); 200.8
2. Dissolved Cations (calcium, magnesium); 200.8
3. Hardness; SM2340B

Sample Identifications:

IA1-30A-100112
IA1-28A-100112
IA1-55-100112
DUP-100112-A (field duplicate for IA1-55-100112)

## 1. PRESERVATION AND HOLDING TIMES

Preservation: Acceptable.

Holding Time: Acceptable.

## 2. BLANKS

Non-detected for all laboratory reagent blanks (LRBs).

Qualification: No qualification was necessary.

## 3. LABORATORY CONTROL SAMPLES

Acceptable.

## 4. DUPLICATE ANALYSES

Acceptable.

## 5. SPIKE SAMPLE ANALYSES

Acceptable. Note that the percent recoveries (%Rs) of -6560% and -6580% for dissolved calcium and 44% and 54% for magnesium in the matrix spike (MS)/matrix spike duplicate (MSD), and 66% for total selenium in the MS analyses of sample DUP-100112-A (10207426-004) (field duplicate for sample IA1-55-100112) exceeded the 75-125%R control limits for metals. For sample results that exceed four-times the concentration of the spike, spike recovery limits do not apply and the data are not considered to exceed acceptance criteria, even if the %Rs do not meet the specified control limits, as specified in the Functional Guidelines. As the sample results exceeded four times the spike, no qualifiers are applicable.

## 6. OVERALL ASSESSMENT

No other issues were identified.

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October 15, 2012

Mitchell Hart
Nu-West Industries, Inc
3010 Conda Road
Soda Springs, ID 83276

RE: Project: North Maybe Mine
Pace Project No.: 10207426

Dear Mitchell Hart:
Enclosed are the analytical results for sample(s) received by the laboratory on October 03, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Cindy Emmons, Norwest Corporation
James Williams, Agrium

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## CERTIFICATIONS

Project: North Maybe Mine
Pace Project No.: 10207426

**Minnesota Certification IDs**
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Hawaii Certification #Pace
Idaho Certification #: MN00064
Illinois Certification #: 200011
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia/DCLS Certification #: 002521
Virginia/VELAP Certification #: 460163
Washington Certification #: C754
West Virginia Certification #: 382
Wisconsin Certification #: 999407970

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## SAMPLE SUMMARY

Project: North Maybe Mine
Pace Project No.: 10207426

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| 10207426001 | IA1-30A-100112 | Water | 10/01/12 12:40 | 10/03/12 09:33 |
| 10207426002 | IA1-28A-100112 | Water | 10/01/12 12:55 | 10/03/12 09:33 |
| 10207426003 | IA1-55-100112 | Water | 10/01/12 13:10 | 10/03/12 09:33 |
| 10207426004 | DUP-100112-A | Water | 10/01/12 13:30 | 10/03/12 09:33 |

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## SAMPLE ANALYTE COUNT

Project: North Maybe Mine
Pace Project No.: 10207426

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| 10207426001 | IA1-30A-100112 | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |
| 10207426002 | IA1-28A-100112 | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |
| 10207426003 | IA1-55-100112 | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |
| 10207426004 | DUP-100112-A | EPA 200.8 | RJS | 6 | PASI-M |
| | | EPA 200.8 | RJS | 9 | PASI-M |

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10207426

**Method:** EPA 200.8
**Description:** 200.8 MET ICPMS
**Client:** Agrium- Nu-West
**Date:** October 15, 2012

**General Information:**
4 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/35542

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10207426004,10207466001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1302168)
  - Selenium

**Additional Comments:**

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10207426

**Method:** EPA 200.8
**Description:** 200.8 MET ICPMS, Dissolved
**Client:** Agrium- Nu-West
**Date:** October 15, 2012

**General Information:**
4 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/35541

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10207426004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1302163)
  - Calcium, Dissolved
  - Magnesium, Dissolved
- MSD (Lab ID: 1302164)
  - Calcium, Dissolved
  - Magnesium, Dissolved

**Additional Comments:**

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## PROJECT NARRATIVE

Project: North Maybe Mine
Pace Project No.: 10207426

**Method:** **EPA 200.8**
**Description:** 200.8 MET ICPMS, Dissolved
**Client:** Agrium- Nu-West
**Date:** October 15, 2012

Analyte Comments:

QC Batch: MPRP/35541

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1302163)
  - Calcium, Dissolved
- MSD (Lab ID: 1302164)
  - Calcium, Dissolved

This data package has been reviewed for quality and completeness and is approved for release.

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10207426

**Sample: IA1-30A-100112** **Lab ID: 10207426001** Collected: 10/01/12 12:40 Received: 10/03/12 09:33 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.00041** | mg/L | 0.000080 | 0.000028 | 1 | 10/04/12 18:57 | 10/09/12 21:13 | 7440-43-9 | |
| Chromium | **0.0045** | mg/L | 0.00050 | 0.000094 | 1 | 10/04/12 18:57 | 10/09/12 21:13 | 7440-47-3 | |
| Nickel | **0.0075** | mg/L | 0.00050 | 0.00015 | 1 | 10/04/12 18:57 | 10/09/12 21:13 | 7440-02-0 | |
| Selenium | **2.0** | mg/L | 0.0050 | 0.00094 | 10 | 10/04/12 18:57 | 10/11/12 14:05 | 7782-49-2 | |
| Vanadium | **0.021** | mg/L | 0.00010 | 0.000037 | 1 | 10/04/12 18:57 | 10/09/12 21:13 | 7440-62-2 | |
| Zinc | **0.014** | mg/L | 0.0050 | 0.0010 | 1 | 10/04/12 18:57 | 10/09/12 21:13 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.00031** | mg/L | 0.000080 | 0.000028 | 1 | 10/04/12 18:55 | 10/06/12 07:35 | 7440-43-9 | |
| Calcium, Dissolved | **183** | mg/L | 0.40 | 0.20 | 20 | 10/04/12 18:55 | 10/08/12 17:46 | 7440-70-2 | |
| Chromium, Dissolved | **0.0045** | mg/L | 0.00050 | 0.000094 | 1 | 10/04/12 18:55 | 10/06/12 07:35 | 7440-47-3 | |
| Magnesium, Dissolved | **26.6** | mg/L | 0.025 | 0.012 | 5 | 10/04/12 18:55 | 10/06/12 07:39 | 7439-95-4 | |
| Nickel, Dissolved | **0.0069** | mg/L | 0.00050 | 0.00015 | 1 | 10/04/12 18:55 | 10/06/12 07:35 | 7440-02-0 | |
| Selenium, Dissolved | **2.0** | mg/L | 0.0025 | 0.00047 | 5 | 10/04/12 18:55 | 10/06/12 07:39 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **566** | mg/L | 1.4 | 0.71 | 20 | 10/04/12 18:55 | 10/08/12 17:46 | | |
| Vanadium, Dissolved | **0.020** | mg/L | 0.00010 | 0.000037 | 1 | 10/04/12 18:55 | 10/06/12 07:35 | 7440-62-2 | |
| Zinc, Dissolved | **0.013** | mg/L | 0.0050 | 0.0010 | 1 | 10/04/12 18:55 | 10/10/12 09:33 | 7440-66-6 | |

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10207426

**Sample: IA1-28A-100112** **Lab ID: 10207426002** Collected: 10/01/12 12:55 Received: 10/03/12 09:33 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.00076** | mg/L | 0.000080 | 0.000028 | 1 | 10/04/12 18:57 | 10/09/12 21:17 | 7440-43-9 | |
| Chromium | **0.0049** | mg/L | 0.00050 | 0.000094 | 1 | 10/04/12 18:57 | 10/09/12 21:17 | 7440-47-3 | |
| Nickel | **0.017** | mg/L | 0.00050 | 0.00015 | 1 | 10/04/12 18:57 | 10/09/12 21:17 | 7440-02-0 | |
| Selenium | **2.1** | mg/L | 0.0050 | 0.00094 | 10 | 10/04/12 18:57 | 10/11/12 14:10 | 7782-49-2 | |
| Vanadium | **0.035** | mg/L | 0.00010 | 0.000037 | 1 | 10/04/12 18:57 | 10/09/12 21:17 | 7440-62-2 | |
| Zinc | **0.023** | mg/L | 0.0050 | 0.0010 | 1 | 10/04/12 18:57 | 10/09/12 21:17 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.00030** | mg/L | 0.000080 | 0.000028 | 1 | 10/04/12 18:55 | 10/06/12 08:25 | 7440-43-9 | |
| Calcium, Dissolved | **160** | mg/L | 0.40 | 0.20 | 20 | 10/04/12 18:55 | 10/08/12 17:51 | 7440-70-2 | |
| Chromium, Dissolved | **0.0048** | mg/L | 0.00050 | 0.000094 | 1 | 10/04/12 18:55 | 10/06/12 08:25 | 7440-47-3 | |
| Magnesium, Dissolved | **28.2** | mg/L | 0.010 | 0.0046 | 2 | 10/04/12 18:55 | 10/10/12 09:38 | 7439-95-4 | |
| Nickel, Dissolved | **0.016** | mg/L | 0.00050 | 0.00015 | 1 | 10/04/12 18:55 | 10/06/12 08:25 | 7440-02-0 | |
| Selenium, Dissolved | **2.0** | mg/L | 0.0025 | 0.00047 | 5 | 10/04/12 18:55 | 10/06/12 08:29 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **516** | mg/L | 1.4 | 0.71 | 20 | 10/04/12 18:55 | 10/08/12 17:51 | | |
| Vanadium, Dissolved | **0.035** | mg/L | 0.00010 | 0.000037 | 1 | 10/04/12 18:55 | 10/06/12 08:25 | 7440-62-2 | |
| Zinc, Dissolved | **0.026** | mg/L | 0.010 | 0.0020 | 2 | 10/04/12 18:55 | 10/10/12 09:38 | 7440-66-6 | |

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10207426

**Sample: IA1-55-100112** **Lab ID: 10207426003** Collected: 10/01/12 13:10 Received: 10/03/12 09:33 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0023** | mg/L | 0.000080 | 0.000028 | 1 | 10/04/12 18:57 | 10/09/12 21:21 | 7440-43-9 | |
| Chromium | **0.0053** | mg/L | 0.00050 | 0.000094 | 1 | 10/04/12 18:57 | 10/09/12 21:21 | 7440-47-3 | |
| Nickel | **0.020** | mg/L | 0.00050 | 0.00015 | 1 | 10/04/12 18:57 | 10/09/12 21:21 | 7440-02-0 | |
| Selenium | **2.1** | mg/L | 0.0050 | 0.00094 | 10 | 10/04/12 18:57 | 10/11/12 05:39 | 7782-49-2 | |
| Vanadium | **0.036** | mg/L | 0.00010 | 0.000037 | 1 | 10/04/12 18:57 | 10/09/12 21:21 | 7440-62-2 | |
| Zinc | **0.085** | mg/L | 0.0050 | 0.0010 | 1 | 10/04/12 18:57 | 10/09/12 21:21 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0023** | mg/L | 0.000080 | 0.000028 | 1 | 10/04/12 18:55 | 10/06/12 08:47 | 7440-43-9 | |
| Calcium, Dissolved | **206** | mg/L | 0.40 | 0.20 | 20 | 10/04/12 18:55 | 10/08/12 17:55 | 7440-70-2 | |
| Chromium, Dissolved | **0.0049** | mg/L | 0.00050 | 0.000094 | 1 | 10/04/12 18:55 | 10/06/12 08:47 | 7440-47-3 | |
| Magnesium, Dissolved | **28.3** | mg/L | 0.025 | 0.012 | 5 | 10/04/12 18:55 | 10/10/12 09:42 | 7439-95-4 | |
| Nickel, Dissolved | **0.020** | mg/L | 0.00050 | 0.00015 | 1 | 10/04/12 18:55 | 10/06/12 08:47 | 7440-02-0 | |
| Selenium, Dissolved | **2.1** | mg/L | 0.0025 | 0.00047 | 5 | 10/04/12 18:55 | 10/10/12 09:42 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **632** | mg/L | 1.4 | 0.71 | 20 | 10/04/12 18:55 | 10/08/12 17:55 | | |
| Vanadium, Dissolved | **0.035** | mg/L | 0.00010 | 0.000037 | 1 | 10/04/12 18:55 | 10/06/12 08:47 | 7440-62-2 | |
| Zinc, Dissolved | **0.097** | mg/L | 0.025 | 0.0050 | 5 | 10/04/12 18:55 | 10/10/12 09:42 | 7440-66-6 | |

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## ANALYTICAL RESULTS

Project: North Maybe Mine
Pace Project No.: 10207426

**Sample: DUP-100112-A** **Lab ID: 10207426004** Collected: 10/01/12 13:30 Received: 10/03/12 09:33 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.8 MET ICPMS** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium | **0.0023** | mg/L | 0.000080 | 0.000028 | 1 | 10/04/12 18:57 | 10/09/12 21:26 | 7440-43-9 | |
| Chromium | **0.0052** | mg/L | 0.00050 | 0.000094 | 1 | 10/04/12 18:57 | 10/09/12 21:26 | 7440-47-3 | |
| Nickel | **0.021** | mg/L | 0.00050 | 0.00015 | 1 | 10/04/12 18:57 | 10/09/12 21:26 | 7440-02-0 | |
| Selenium | **2.0** | mg/L | 0.0025 | 0.00047 | 5 | 10/04/12 18:57 | 10/09/12 21:41 | 7782-49-2 | M1 |
| Vanadium | **0.036** | mg/L | 0.00010 | 0.000037 | 1 | 10/04/12 18:57 | 10/09/12 21:26 | 7440-62-2 | |
| Zinc | **0.087** | mg/L | 0.0050 | 0.0010 | 1 | 10/04/12 18:57 | 10/09/12 21:26 | 7440-66-6 | |
| **200.8 MET ICPMS, Dissolved** | Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 | | | | | | | | |
| Cadmium, Dissolved | **0.0022** | mg/L | 0.000080 | 0.000028 | 1 | 10/04/12 18:55 | 10/06/12 08:55 | 7440-43-9 | |
| Calcium, Dissolved | **200** | mg/L | 0.40 | 0.20 | 20 | 10/04/12 18:55 | 10/08/12 18:00 | 7440-70-2 | M1 |
| Chromium, Dissolved | **0.0049** | mg/L | 0.00050 | 0.000094 | 1 | 10/04/12 18:55 | 10/06/12 08:55 | 7440-47-3 | |
| Magnesium, Dissolved | **28.3** | mg/L | 0.025 | 0.012 | 5 | 10/04/12 18:55 | 10/10/12 09:46 | 7439-95-4 | M1 |
| Nickel, Dissolved | **0.019** | mg/L | 0.00050 | 0.00015 | 1 | 10/04/12 18:55 | 10/06/12 08:55 | 7440-02-0 | |
| Selenium, Dissolved | **2.1** | mg/L | 0.0025 | 0.00047 | 5 | 10/04/12 18:55 | 10/10/12 09:46 | 7782-49-2 | |
| Total Hardness by 2340B, Dissolved | **615** | mg/L | 1.4 | 0.71 | 20 | 10/04/12 18:55 | 10/08/12 18:00 | | |
| Vanadium, Dissolved | **0.035** | mg/L | 0.00010 | 0.000037 | 1 | 10/04/12 18:55 | 10/06/12 08:55 | 7440-62-2 | |
| Zinc, Dissolved | **0.083** | mg/L | 0.025 | 0.0050 | 5 | 10/04/12 18:55 | 10/10/12 09:46 | 7440-66-6 | |

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## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10207426

QC Batch: MPRP/35542 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10207426001, 10207426002, 10207426003, 10207426004

METHOD BLANK: 1302165 Matrix: Water
Associated Lab Samples: 10207426001, 10207426002, 10207426003, 10207426004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Cadmium | mg/L | <0.000028 | 0.000080 | 10/09/12 20:12 | |
| Chromium | mg/L | <0.000094 | 0.00050 | 10/09/12 20:12 | |
| Nickel | mg/L | <0.00015 | 0.00050 | 10/09/12 20:12 | |
| Selenium | mg/L | <0.000094 | 0.00050 | 10/09/12 20:12 | |
| Vanadium | mg/L | <0.000037 | 0.00010 | 10/09/12 20:12 | |
| Zinc | mg/L | <0.0010 | 0.0050 | 10/09/12 20:12 | |

LABORATORY CONTROL SAMPLE: 1302166

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Cadmium | mg/L | .08 | 0.082 | 103 | 85-115 | |
| Chromium | mg/L | .08 | 0.081 | 101 | 85-115 | |
| Nickel | mg/L | .08 | 0.087 | 109 | 85-115 | |
| Selenium | mg/L | .08 | 0.080 | 100 | 85-115 | |
| Vanadium | mg/L | .08 | 0.082 | 103 | 85-115 | |
| Zinc | mg/L | .08 | 0.084 | 105 | 85-115 | |

MATRIX SPIKE SAMPLE: 1302167

| Parameter | Units | 10207466001 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Cadmium | mg/L | <0.000080 | .08 | 0.080 | 100 | 70-130 | |
| Chromium | mg/L | <0.0010 | .08 | 0.080 | 100 | 70-130 | |
| Nickel | mg/L | <0.00050 | .08 | 0.087 | 108 | 70-130 | |
| Selenium | mg/L | <0.0010 | .08 | 0.079 | 99 | 70-130 | |
| Vanadium | mg/L | <0.10 ug/L | .08 | 0.081 | 101 | 70-130 | |
| Zinc | mg/L | <0.0080 | .08 | 0.086 | 108 | 70-130 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1302168 1302169

| Parameter | Units | 10207426004 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cadmium | mg/L | 0.0023 | .08 | .08 | 0.083 | 0.083 | 101 | 101 | 70-130 | .5 | 20 | |
| Chromium | mg/L | 0.0052 | .08 | .08 | 0.084 | 0.085 | 98 | 100 | 70-130 | 2 | 20 | |
| Nickel | mg/L | 0.021 | .08 | .08 | 0.11 | 0.11 | 106 | 106 | 70-130 | .3 | 20 | |
| Selenium | mg/L | 2.0 | .08 | .08 | 2.1 | 2.1 | 66 | 97 | 70-130 | 1 | 20 | M1 |
| Vanadium | mg/L | 0.036 | .08 | .08 | 0.12 | 0.12 | 100 | 102 | 70-130 | 2 | 20 | |
| Zinc | mg/L | 0.087 | .08 | .08 | 0.17 | 0.18 | 107 | 121 | 70-130 | 6 | 20 | |

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## QUALITY CONTROL DATA

Project: North Maybe Mine
Pace Project No.: 10207426

QC Batch: MPRP/35541 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10207426001, 10207426002, 10207426003, 10207426004

METHOD BLANK: 1302161 Matrix: Water
Associated Lab Samples: 10207426001, 10207426002, 10207426003, 10207426004

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | <0.000028 | 0.000080 | 10/06/12 07:57 | |
| Calcium, Dissolved | mg/L | <0.010 | 0.020 | 10/06/12 07:57 | |
| Chromium, Dissolved | mg/L | <0.000094 | 0.00050 | 10/06/12 07:57 | |
| Magnesium, Dissolved | mg/L | <0.0023 | 0.0050 | 10/06/12 07:57 | |
| Nickel, Dissolved | mg/L | <0.00015 | 0.00050 | 10/06/12 07:57 | |
| Selenium, Dissolved | mg/L | <0.000094 | 0.00050 | 10/06/12 07:57 | |
| Total Hardness by 2340B, Dissolved | mg/L | <0.036 | 0.071 | 10/06/12 07:57 | |
| Vanadium, Dissolved | mg/L | <0.000037 | 0.00010 | 10/06/12 07:57 | |
| Zinc, Dissolved | mg/L | <0.0010 | 0.0050 | 10/10/12 14:50 | |

LABORATORY CONTROL SAMPLE: 1302162

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | .08 | 0.081 | 102 | 85-115 | |
| Calcium, Dissolved | mg/L | 1 | 1.0 | 102 | 85-115 | |
| Chromium, Dissolved | mg/L | .08 | 0.080 | 100 | 85-115 | |
| Magnesium, Dissolved | mg/L | 1 | 1.0 | 102 | 85-115 | |
| Nickel, Dissolved | mg/L | .08 | 0.083 | 104 | 85-115 | |
| Selenium, Dissolved | mg/L | .08 | 0.084 | 105 | 85-115 | |
| Total Hardness by 2340B, Dissolved | mg/L | 6.6 | 6.7 | 102 | 85-115 | |
| Vanadium, Dissolved | mg/L | .08 | 0.080 | 99 | 85-115 | |
| Zinc, Dissolved | mg/L | .08 | 0.079 | 99 | 85-115 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1302163 1302164

| Parameter | Units | 10207426004 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cadmium, Dissolved | mg/L | 0.0022 | .08 | .08 | 0.081 | 0.083 | 98 | 100 | 70-130 | 2 | 20 | |
| Calcium, Dissolved | mg/L | 200 | 1 | 1 | 134 | 134 | -6560 | -6580 | 70-130 | .2 | 20 | E,M1 |
| Chromium, Dissolved | mg/L | 0.0049 | .08 | .08 | 0.082 | 0.083 | 96 | 98 | 70-130 | 1 | 20 | |
| Magnesium, Dissolved | mg/L | 28.3 | 1 | 1 | 28.7 | 28.8 | 44 | 54 | 70-130 | .3 | 20 | M1 |
| Nickel, Dissolved | mg/L | 0.019 | .08 | .08 | 0.099 | 0.10 | 100 | 101 | 70-130 | 1 | 20 | |
| Selenium, Dissolved | mg/L | 2.1 | .08 | .08 | 2.2 | 2.2 | 128 | 100 | 70-130 | 1 | 20 | |
| Total Hardness by 2340B, Dissolved | mg/L | 615 | 6.6 | 6.6 | 453 | 453 | -2450 | -2450 | 70-130 | .05 | 20 | |
| Vanadium, Dissolved | mg/L | 0.035 | .08 | .08 | 0.11 | 0.11 | 97 | 96 | 70-130 | .6 | 20 | |
| Zinc, Dissolved | mg/L | 0.083 | .08 | .08 | 0.16 | 0.17 | 102 | 109 | 70-130 | 3 | 20 | |



**REPORT OF LABORATORY ANALYSIS**

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(612)607-1700

## QUALIFIERS

Project: North Maybe Mine
Pace Project No.: 10207426

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

| | |
|---|---|
| E | Analyte concentration exceeded the calibration range. The reported result is estimated. |
| M1 | Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery. |

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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: North Maybe Mine
Pace Project No.: 10207426

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **10207426001** | **IA1-30A-100112** | EPA 200.8 | MPRP/35542 | EPA 200.8 | ICPM/14014 |
| **10207426002** | **IA1-28A-100112** | EPA 200.8 | MPRP/35542 | EPA 200.8 | ICPM/14014 |
| **10207426003** | **IA1-55-100112** | EPA 200.8 | MPRP/35542 | EPA 200.8 | ICPM/14014 |
| **10207426004** | **DUP-100112-A** | EPA 200.8 | MPRP/35542 | EPA 200.8 | ICPM/14014 |
| **10207426001** | **IA1-30A-100112** | EPA 200.8 | MPRP/35541 | EPA 200.8 | ICPM/13991 |
| **10207426002** | **IA1-28A-100112** | EPA 200.8 | MPRP/35541 | EPA 200.8 | ICPM/13991 |
| **10207426003** | **IA1-55-100112** | EPA 200.8 | MPRP/35541 | EPA 200.8 | ICPM/13991 |
| **10207426004** | **DUP-100112-A** | EPA 200.8 | MPRP/35541 | EPA 200.8 | ICPM/13991 |

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RUSH (C) 10-3-12

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10207426

Page: 1 of 1

**Section A** Required Client Information:

| | |
|---|---|
| Company: | Agrium/Nu-West |
| Address: | 3010 Conda Rd |
| | Soda Springs, ID. 83276 |
| Email To: | Mitchell.Hart@agrium.com |
| Phone: 208-547-3935 | Fax: |
| Requested Due Date/TAT: | 7-10 Business Days |

**Section B** Required Project Information:

| | |
|---|---|
| Report To: | James.Williams@agrium.com |
| Copy To: | Julie.Lincoln@aecom.com |
| Purchase Order No.: | 4800058265 |
| Project Name: | North Maybe Mine |
| Project Number: | |

**Section C** Invoice Information:

| | |
|---|---|
| Attention: | Accounts Payable |
| Company Name: | Nu-West Industries, Inc. |
| Address: | Calgary, Alberta, Canada T2H 3B9 |
| Pace Quote Reference: | Nor_040612_NMM SW |
| Pace Project Manager: | Sally Heinje |
| Pace Profile #: | |

**REGULATORY AGENCY**

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: ID

**Section D** Required Client Information

**SAMPLE ID** (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

| MATRIX | CODE |
|---|---|
| DRINKING WATER | DW |
| WATER | WT |
| WASTE WATER | WW |
| PRODUCT | P |
| SOIL/SOLID | SL |
| OIL | OL |
| WIPE | WP |
| AIR | AR |
| OTHER | OT |
| TISSUE | TS |

| ITEM # | SAMPLE ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED COMPOSITE START DATE | COLLECTED COMPOSITE START TIME | COLLECTED COMPOSITE END/GRAB DATE | COLLECTED COMPOSITE END/GRAB TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Analysis Test Y/N | Table 4-1 (enclosed) | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | IA1-30A-100112 | WT | G | 10/01/12 | | 1240 | | | 2 | | | ✓ | | | | | | X | | | 10207426001 |
| 2 | IA1-28A-100112 | WT | G | 10/01/12 | | 1255 | | | 2 | | | ✓ | | | | | | X | | | 002 |
| 3 | IA1-55-100112 | WT | G | 10/01/12 | | 1310 | | | 2 | | | ✓ | | | | | | X | | | 003 |
| 4 | DUP-100112-A | WT | G | 10/01/12 | | 1330 | | | 2 | | | ✓ | | | | | | X | | | 004 |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS |
|---|---|---|---|---|---|---|---|
| cooler id # 104579 | James B. Williams | 10/02/12 | 0800 | CSI pace | 10.3.12 | 9:33 | 5.3 / Y / Y / Y |
| Level III data package | | | | | | | |
| | | | | | | | |

16 of 18

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: James B. Williams

SIGNATURE of SAMPLER: James B. Williams DATE Signed (MM/DD/YY): 10/01/12

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

## Table 4-1 Surface water Analyte List for April, May, June, August, September and October

| Analyte | Analytical Method | Container Size | | Container Material | Preservative | Holding Time | Detection Limit/Units |
|---|---|---|---|---|---|---|---|
| | | Total | Dissolved | | | | |
| Cadmium – total & dissolved* | EPA M200.8 | 250 ml | 250 ml* | Polyethylene | Nitric Acid | 180 Days | 0.1 µg/L |
| Chromium – total & dissolved* | EPA M200.8 | | | | | | 0.1 µg/L |
| Nickel – total & dissolved* | EPA M200.8 | | | | | | 0.6 µg/L |
| Selenium – total & dissolved* | EPA M200.8 | | | | | | 0.1 µg/L |
| Vanadium – total & dissolved* | EPA M200.8 | | | | | | 0.2 µg/L |
| Zinc – total & dissolved* | EPA M200.8 | | | | | | 2 µg/L |
| Hardness | EPA SM2340B (Calculated) | - | | Polyethylene | Nitric Acid | 180 Days | 2 mg/L |
| pH | Field | - | - | - | - | Analyze immediately | standard units |
| ORP | Field | - | - | - | - | | mV |
| Dissolved Oxygen | Field | - | - | - | - | | mg/L |
| Conductivity | Field | - | - | - | - | | µmhos/cm |
| Temperature | Field | - | - | - | - | | °C |
| Turbidity | Field | - | - | - | - | | NTU |

* Sample for dissolved analysis will be field filtered using a disposable 0.45 micron filter prior to preservation
ml = milliliters
µg/L = micrograms per liter
mg/L = milligrams per liter
mV = millivolts
µmhos/cm = micromhos per centimeter
°C = degrees Celsius
NTU = nephelometric turbidity units

| Pace Analytical | Document Name: Sample Condition Upon Receipt Form | Document Revised: 22Aug2012 Page 1 of 1 |
|---|---|---|
| | Document No.: F-MN-L-213-rev.04 | Issuing Authority: Pace Minnesota Quality Office |

**Sample Condition Upon Receipt**

**Client Name:** Agrium-Northwest

**Project #:** WO# : 10207426

10207426

**Courier:** ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other: _____

**Tracking Number:** 4569 1406 4407

**Custody Seal on Cooler/Box Present?** ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No

**Optional:** Proj. Due Date: Proj. Name:

**Packing Material:** ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other: _____ **Temp Blank?** ☑ Yes ☐ No

**Thermometer Used:** ☑ 888A912167504 ☐ 80512447 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

**Cooler Temperature:** 5.3 **Biological Tissue Frozen?** ☐ Yes ☐ No **Date and Initials of Person Examining Contents:** EJ 10.3.12

Temp should be above freezing to 6°C

| | | | | Comments: |
|---|---|---|---|---|
| Chain of Custody Present? | ☑ Yes | ☐ No | ☐ N/A | 1. |
| Chain of Custody Filled Out? | ☑ Yes | ☐ No | ☐ N/A | 2. |
| Chain of Custody Relinquished? | ☑ Yes | ☐ No | ☐ N/A | 3. |
| Sampler Name and/or Signature on COC? | ☑ Yes | ☐ No | ☐ N/A | 4. |
| Samples Arrived within Hold Time? | ☑ Yes | ☐ No | ☐ N/A | 5. |
| **Short Hold Time Analysis (<72 hr)?** | ☐ Yes | ☑ No | ☐ N/A | 6. |
| **Rush Turn Around Time Requested?** | ☑ Yes | ☐ No | ☐ N/A | 7. |
| Sufficient Volume? | ☑ Yes | ☐ No | ☐ N/A | 8. |
| Correct Containers Used? | ☑ Yes | ☐ No | ☐ N/A | 9. |
| -Pace Containers Used? | ☑ Yes | ☐ No | ☐ N/A | |
| Containers Intact? | ☑ Yes | ☐ No | ☐ N/A | 10. |
| Filtered Volume Received for Dissolved Tests? | ☑ Yes | ☐ No | ☐ N/A | 11. |
| Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT | ☑ Yes | ☐ No | ☐ N/A | 12. |
| All containers needing acid/base preservation have been checked? Noncompliances are noted in 13. | ☑ Yes | ☐ No | ☐ N/A | 13. ☑ $HNO_3$ 2-2 ☐ $H_2SO_4$ ☐ NaOH ☐ HCl |
| All containers needing preservation are found to be in compliance with EPA recommendation? ($HNO_3$, $H_2SO_4$, HCl<2; NaOH>12) | ☑ Yes | ☐ No | ☐ N/A | Sample # 30A, 28A, 55B UP |
| Exceptions: VOA, Coliform, TOC, Oil and Grease, WI-DRO (water) | ☐ Yes | ☑ No | | Initial when completed: EJ Lot # of added preservative: |
| Headspace in VOA Vials ( >6mm)? | ☐ Yes | ☐ No | ☑ N/A | 14. |
| Trip Blank Present? | ☐ Yes | ☐ No | ☑ N/A | 15. |
| Trip Blank Custody Seals Present? | ☐ Yes | ☐ No | ☑ N/A | |
| Pace Trip Blank Lot # (If purchased): | | | | |

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

**Project Manager Review:** _____ **Date:** _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers)

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 10**
1200 SIXTH AVENUE
SEATTLE, WA 98101

# TARGET SHEET

**The following document was not imaged.**
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## *Document Information*

Document ID #: 1453472
File #: 6.4 v2
Site Name: USDA North Maybe Mine (NMYSF)

2012 Annual Inspection and Maintenance Report for the East Mill Creek Restored Sediment Control Structure December 2012.